

1992 LOWER COOK INLET AREA
ANNUAL FINFISH MANAGEMENT REPORT



by
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ANNUAL MANAGEMENT REPORT
LOWER COOK INLET
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COMMERCIAL SALMON FISHERY

INTRODUCTION

The Lower Cook Inlet (LCI) management area is comprised of all waters west of the longitude of Cape Fairfield, north of the latitude of Cape Douglas, and south of the latitude of Anchor Point, and is divided into five fishing districts (Figure 1). The Barren Islands District is the only non-salmon fishing district, and the remaining four districts have been separated into nearly 40 subdistricts and sections to facilitate management of discrete stocks of salmon and herring.

The 1992 Lower Cook Inlet commercial salmon harvest was below average for the third consecutive season. The total catch of 686,408 fish (Figure 8, Appendix Table 5) accounted for 39% of the preseason forecast. Fishing effort was comparable to levels in previous years with 63 seine and 21 set gillnet permit holders making deliveries (Appendix Table 1). The harvest was only about half of the long-term (1972-91) average, with an exvessel value of \$1.47 million (Table 7, Appendix Table 2).

Nearly three-fourths of the sockeye salmon harvest was produced by two FRED Division/Cook Inlet Aquaculture Association (CIAA) lake stocking projects at Kirschner Lake in the Kamishak Bay District and Leisure/Hazel Lakes in the Southern District. Returns of both enhanced stocks and naturally produced stocks of pink salmon,

normally the dominant species in numbers of fish, were poor throughout Lower Cook Inlet, and the total harvest of 480,000 fish was only 50% of the long-term average (Figure 12, Appendix Table 18). Pink salmon returns to Tutka Hatchery and a satellite release site at Halibut Cove, both in the Southern District, contributed 373,500 fish to the catches (Table 9), providing the bulk (78%) of the commercial pink harvests in Lower Cook Inlet during 1992.

PRESEASON FORECAST

The 1992 Lower Cook Inlet salmon harvest was projected to be nearly 50% greater than the long-term average. The majority of the harvest was to be from hatchery and lake stocking enhancement projects. Formal total run forecasts for natural salmon returns other than pink salmon were not available because long-term escapement and age-weight-length data are limited for those species. However, catch projections were calculated from relative estimates of parental run size, average age composition data, and recent relative productivity trends. Harvest potential and actual catches for all species in 1992 are listed below:

SPECIES	PROJECTED HARVEST	ACTUAL HARVEST	1972-1991 AVERAGE
Chinook	8,400	1,891	898
Sockeye	483,000	176,644	152,866
Coho	17,200	5,902	11,655
Pink	1,131,000	479,768	942,130
Chum	143,000	22,203	112,395
TOTAL	1,782,600	686,408	1,219,944

Strong sockeye returns were anticipated in all areas, with the exception of English Bay in the Southern District. Enhanced runs

to Leisure and Chenik Lakes were expected to dominate the returns. Chenik Lake was fertilized during 1987, 1989, 1990, and 1991, to increase food production. Stocking of 2.6 million and 3.5 million fry (originating from Crooked Creek Hatchery) into Chenik Lake took place in 1988 and 1989, respectively. These stocked fish were additional to fry produced by natural adult escapements near the desired levels during those years. The majority of those fish, both natural and stocked, left the lake as smolt in 1989 and 1990, with adult returns expected in 1991 and 1992. Significant numbers of adult sockeye were also expected to return as a result of two other lake stocking projects at Hazel Lake in the Southern District and Kirschner Lake in the Kamishak Bay District.

Because of relatively good pink salmon escapements to Outer District systems in 1990, the 1992 LCI pink salmon harvest was expected to exceed one million fish. Very few pinks were expected in the Eastern District, but there was potential for significant harvests in the Outer District at Port Dick and in Nuka Bay. Despite fair parent year escapements, returns to all naturally producing streams in the Southern District were expected to provide only limited harvests, with Humpy Creek and Seldovia Bay having the best potential.

Returns to the Tutka Bay Hatchery and a secondary fry release site at Halibut Cove Lagoon were expected to be the mainstay of the pink salmon fishery. A harvest of 520,000 pinks was expected as a result of fish returning to Tutka Bay Hatchery, with an additional 165,000 fish projected for Halibut Cove Lagoon. Nearly 30 million fry were released in 1991 at these locations and good ocean survival rates should have produced adult returns approaching 900,000 fish.

Escapements into the three major Kamishak Bay District pink streams failed to achieve the minimum desired levels during the 1990 brood year. As a result, significant harvests of pinks were not expected

in that district in 1992. Additionally, substantial chum salmon harvests appeared unlikely in 1992. Despite relatively good escapements during the 1988 and 1989 parent years, weak returns over the past three seasons suggested that the 1992 chum return would likely be weak as well.

SUMMARY BY SPECIES

Chinook Salmon

The harvest of chinook salmon, not normally a commercially important species in Lower Cook Inlet, was more than double the 1972-91 average and only two fish less than the historical high catch of 1989 (Appendix Table 12). The catch of 1,891 was primarily due to enhanced production in Halibut Cove Lagoon and Seldovia Bay (Table 2). Set gillnets accounted for 68% of the catch (Table 1).

Sockeye Salmon

The total LCI harvest of 176,600 sockeyes was the lowest total since 1982 and only 15% greater than the 20-year average (Figure 9, Appendix Table 13). Although the harvest fell far below the preseason projection of 483,000 fish, and only accounted for one-fourth of the total number of fish landed in 1992, this year's catch comprised nearly 79% of the total value of the Lower Cook Inlet fishery (Table 7, Appendix Table 2).

Returns of sockeye salmon to Mikfik Creek in the Kamishak Bay District initially appeared weak as escapement was minimal during the first week of June and very few fish were harvested during the first 10 days after the June 1 regulatory opening. As a result, the few boats targeting the run left the area. The final estimated escapement of 7,800 fish exceeded the goal of 5-7,000 fish, but the

majority of this escapement came in a burst just days after the commercial effort had shifted to other areas. By the time several vessels returned to the area late in June, the run was essentially over.

Returns to FRED Division enhancement projects, which account for the bulk of the sockeye harvested in LCI, were generally below expectations. Despite large fry releases, natural escapements near desired levels, and lake fertilization at Chenik Lake in the Kamishak Bay District, the harvest of 14,400 fish (including cost recovery; Appendix Table 16) was only 12% of the preseason projection. In contrast, returns of sockeye salmon to Kirschner Lake, also in the Kamishak Bay District, produced a catch of 40,000 fish (Table 3), exactly the amount forecast for that system. In the Southern District, the combined Leisure and Hazel Lakes stocking projects produced a catch of 89,800 fish (Appendix Table 15), only 60% of the preseason projection. A predicted return of 9,000 sockeye to Port Dick in the Outer District during 1992, the last year of adult returns to this enhancement site, failed to materialize and resulted in a commercial harvest of only 400 fish. In the Eastern District, first year returns of sockeye salmon as a result of enhancement at Bear Lake in Resurrection Bay were disappointing, with no commercial harvest occurring and a total run of only 1,900 fish.

Natural sockeye runs to Delight/Desire Lakes in the East Arm of Nuka Bay in the Outer District were relatively weak and no commercial openings were allowed. The escapement goal of 10,000 fish for each system was surpassed at Desire Lake with an estimated escapement of 11,900 fish, but the Delight Lake escapement of 5,900 fish failed to achieve the desired level for the fifth straight year (Table 3, Appendix Table 23). Returns to Ecstasy (Delectable) Lakes, a recently formed glacial lake system in East Nuka Bay which

had no documented runs of salmon prior to the mid-1980's, had a peak aerial escapement estimate of 1,000 sockeye salmon during 1992.

Sockeye returns to the English Bay Lake system decreased slightly over those of 1991. A complete closure of the commercial, sport, and subsistence fisheries again this year resulted in a total estimated escapement of 6,400 fish, marking the eighth consecutive year that the escapement into this system has failed to achieve the lower end of the desired range (Table 3, Appendix Table 23).

Coho Salmon

The coho harvest of 5,900 fish was only 50% of the long-term average and the lowest commercial total since 1977 (Appendix Table 17). Over half of the harvest was taken in the Eastern District (Table 1) as a result of Bear Lake hatchery cost recovery efforts, Seward Silver Salmon Derby catches, and incidental harvests during the commercial pink salmon seine fishery in Aialik Bay. The overall weak returns, along with late run timing, discouraged the majority of the fleet from targeting this species in the Kamishak Bay District during the latter part of the season, thus contributing to the low harvests.

Pink Salmon

Returns of pink salmon, normally the dominant species in both numbers of fish and exvessel value, were extremely weak throughout Lower Cook Inlet. The harvest of 479,800 fish was the lowest total since 1987 and only about half of the long-term average (Appendix Table 18). For the third year running, the Tutka Hatchery return was a bitter disappointment. Despite a projected harvest of 685,000 pinks from Tutka Bay and Halibut Cove Lagoon, a secondary release site for Tutka Hatchery fry, these areas contributed only 373,500 fish to the commercial catch this season (Table 9). Of

this total, approximately 276,000 fish (74%) were utilized for hatchery cost recovery, with the remaining 26% taken in the common property fishery. An additional 67,300 fish were collected for hatchery brood stock.

Other than the Southern District, the Eastern District produced the only other significant pink catches during 1992. The catch of pink salmon in Aialik Bay totalled 60,000 fish (Table 5). This was the second consecutive year of strong pink catches in the outer areas of the Aialik Subdistrict and can undoubtedly be attributed to returns of pink salmon bound for Prince William Sound. Pink salmon returns to all Outer and Kamishak Bay District systems were extremely weak in 1992, and as a result no effort and only incidental harvest occurred. In fact, the harvest of 146 pinks in the Outer District was the lowest total since 1976. With the exception of Tutka Lagoon Creek in the Southern District and South Nuka Island Creek in the Outer District, pink escapements into all major systems failed to achieve the desired minimum goals (Table 5, Appendix Table 24).

Chum Salmon

The LCI chum salmon harvest of 22,200 fish was the fifth lowest over the last 20 years and continued a trend of depressed commercial chum harvests seen during the past four years (Figure 8, Appendix Table 21). The poor returns were generally anticipated and conservative fishing schedules were implemented early in the season throughout the Kamishak and Outer Districts to protect chum salmon stocks. Although most major systems failed to achieve their desired escapements, the conservative strategy was successful at limiting the commercial harvest and allowing the majority of the returns, particularly in the Kamishak Bay District, to reach their natal streams (Table 6, Appendix Table 25).

EXVESSEL VALUE

The exvessel value of the 1992 salmon harvest in Lower Cook Inlet was approximately \$1,465,600 (Table 7, Appendix Table 2). Purse seines, which normally account for the majority of the catch, comprised \$1,286,500 or 88% of the total (Table 7). Set gillnets accounted for \$172,800. An estimated \$232,600, or about 16% of the entire exvessel value of the LCI salmon fishery, was utilized for hatchery cost recovery purposes. Average prices paid to fishermen in 1992, not including any postseason adjustments, were as follows: chinook - \$1.29/pound; sockeye - \$1.46/pound; coho - \$0.53/pound; pink - \$0.14/pound; and chum - \$0.27/pound (Appendix Table 3).

DISTRICT INSEASON MANAGEMENT SUMMARIES

Southern District

Set Gillnet Fishery

Commercial set gillnetting in LCI is limited to specific beaches within the Southern District. Although an Area H set gillnet permit is allowed to fish in both Upper and Lower Cook Inlet, there are only five beach areas in Lower Cook Inlet, all located along the south shore of Kachemak Bay, where set gillnets may be used (Figure 2). The limited area provides only enough productive fishing grounds to accommodate approximately 25 set net permits.

The Southern District set gillnet harvest totalled 36,800 fish in 1992 (Table 1). The mixed-species harvest was only 57% of the 1972-91 average, with increased percentages of chinooks and pinks in the catches compared to the long-term average and decreased percentages of sockeyes and cohos (Appendix Table 7). Typically the gillnet harvest is comprised of about 50% sockeye salmon, 40% pink salmon, 5% chums, 5% cohos, and less than 1% chinooks. An

additional 24 hours of fishing per week was allowed in the Halibut Cove area from July 5 through the end of the season, resulting in an increased harvest of all species in this area.

Coho catches by set gillnets were the lowest since 1972, a reflection of generally weak and late returns throughout the management area. The chinook salmon catch of nearly 1,300 fish represented the second highest set gillnet total for this species on record (Appendix Table 7). The high catches were primarily due to chinook salmon returning to enhancement projects at Halibut Cove Lagoon and Seldovia Bay.

Several factors contributed to the low set gillnet harvests in 1992. The sockeye salmon return to the English Bay Lakes system was poor for the eighth consecutive year. In anticipation of a weak return, the Port Graham Subdistrict, including the English Bay Section, was closed to both commercial and subsistence set gillnet fishing, while the freshwater drainage was also closed to sport fishing. Even with these closures, the sockeye salmon escapement to the English Bay system reached only 6,400 fish, 36% less than the low end of the desired escapement range (Table 3, Appendix Table 23). After the sockeye run was effectively over, the subsistence fishery was reopened on July 20, but the commercial fishery was not allowed to resume because of the weak pink salmon returns to Port Graham River.

Fishing effort also affected the set gillnet harvest in the Southern District. The number of set gillnet permits fished this season (21) was down by 10 from the 1975-91 average but was similar to numbers fished during the three previous years (Appendix Table 1).

Seine Fishery

Sockeye Salmon

Purse seiners accounted for 84% of the 106,800 sockeye salmon landed in the Southern District in 1992 (Table 1). The overall catch was similar to the recent 10-year average for the district (Appendix Table 13).

Waters of China Poot Bay and Halibut Cove Subdistrict, and a portion of the Tutka Bay Subdistrict, were again opened to seining five days per week beginning Thursday, June 25, in anticipation of strong returns to Leisure Lake. Preseason harvest projections for returns to the Leisure and Hazel Lakes stocking projects were estimated at 150,000 fish. The actual harvest, including cost recovery, amounted to 89,800 fish, comprising just over half of the total LCI sockeye salmon harvest (Table 3, Figure 5). Because of the geographical proximity of these two projects, the overlapping area of harvest, and the lack of tagging, no definitive estimate of separate returns to each system can be established. However, fish returning as a result of these two projects undoubtedly contributed to the seine catches in the Halibut Cove and Tutka Bay Subdistricts, as well as the China Poot Bay Subdistrict. Personal use dip net fishermen and sport fishermen harvested another 3,800 sockeye at the head of China Poot Bay. The 1992 total return as a result of both projects was estimated at 93,600 fish (Appendix Table 15). Commercial catches peaked on July 14 at 7,400 fish taken by 28 vessels, but fish numbers never approached the expectations of the fleet or the preseason harvest forecast of 150,000 fish.

As outlined in the Trail Lakes Hatchery Annual Management Plan (AMP), the revenue goal necessary to offset operational expenses incurred in LCI sockeye salmon lake stocking projects was set at \$84,380, to be split equally with cost recovery harvests from China

Poot Bay Subdistrict in the Southern District and Chenik Subdistrict in the Kamishak Bay District. Cost recovery harvests inside the China Poot Special Harvest Area (SHA; Figure 3) were to occur during two 12-hour openings on the first two weekends (i.e. closed commercial periods) after the subdistrict opened to seining on June 25. A projected harvest of 10,550 sockeye was originally necessary to achieve the goal of \$42,200, assuming an average price of \$1.00 per pound and an average weight of 4.0 pounds per fish. If the goal was not reached by July 15, the AMP stated that waters of the SHA would be closed to commercial fishing and opened to cost recovery harvest on a continuous basis until the goal was met.

The first two weekends passed with no cost recovery effort occurring and therefore no resultant sockeye harvest. Sockeye catches during open commercial periods at this same time were slow, indicating either a weak return or late run timing. A third 12-hour opening was scheduled for the weekend of July 11-12 for cost recovery purposes, but only 1,800 fish were landed, just 17% of the original goal. However, the actual price paid for these fish was \$1.35 per pound, making this first cost recovery harvest of the season worth approximately \$11,200, or just over one-fourth of the revenue goal. The new higher price forced a downward revision of the number of sockeye necessary to achieve the revenue goal. Nonetheless, because the revenue goal was not achieved by July 15, waters of the China Poot SHA were closed to commercial fishing and opened to cost recovery harvest on a continuous basis effective on that date. Waters of the China Poot Subdistrict outside the SHA remained open to commercial seining five days per week.

Subsequent cost recovery harvests took place in the China Poot SHA on July 18, 19, and 20, totalling slightly over 5,500 fish. This brought the cumulative China Poot cost recovery total to 7,300 sockeyes worth approximately \$41,600, virtually meeting the revenue goal. As a result, the SHA was closed to cost recovery harvest and opened to commercial fishing on a five day per week basis effective

on July 20. By this time, the sockeye return was dwindling and catches steadily declined thereafter, with the last sockeye landing in the subdistrict occurring on August 3. Total combined commercial harvest of sockeye salmon in the China Poot and Hazel Lake Sections of the China Poot Subdistrict, excluding cost recovery harvests, was 68,600 fish (Table 3).

Pink Salmon

Returns of pink salmon to the Tutka Bay Hatchery and to the satellite rearing project in Halibut Cove Lagoon contributed to a total Southern District harvest of 417,000 pink salmon, slightly less than the recent 10-year average (Table 5, Appendix Table 18). The opening of Halibut Cove Lagoon to seining was delayed until July 5 to allow the recreational fishery, targeting on hatchery reared chinook salmon, to continue through the 4th of July holiday without interference from the commercial seine fleet. Waters of Tutka Bay Subdistrict outside of Tutka Bay proper were open to commercial seining five days per week beginning June 25, while waters within the Tutka Bay SHA (Figure 4) were open to hatchery brood stock and cost recovery harvest by authorized agents of CIAA on a continuous basis as established in the Tutka Hatchery Annual Management Plan. The plan called for hatchery incubators to be filled to maximum capacity if possible, and excess fish beyond brood stock and natural escapement requirements were to be harvested for cost recovery to help offset operational expenses. Approximately 60,000 fish (32,000 females) were desired for hatchery brood stock, and an additional 10,000 pinks were needed to meet the natural spawning escapement goal for Tutka Creek.

Early catches, both commercial and hatchery, in the Tutka Subdistrict were poor, and aerial surveys of Tutka Lagoon failed to show a significant buildup of pink salmon. Cost recovery catches peaked on July 15 and 16 but, at levels of 60,000 and 50,000 fish respectively, indicated that the return was exceptionally weak by

historical standards. The common property seine harvest in Tutka Bay Subdistrict reached its highest daily level on July 13 at only 9,000 pinks, with both catch and effort diminishing thereafter. It quickly became evident that the sales harvest goal established by CIAA would not be achieved due to poor returns for the second straight season, therefore the entire Tutka Bay Subdistrict, excluding Tutka Lagoon, was opened to commercial seining five days per week, effective at 6:00 a.m. Thursday, July 30, until further notice. However, less than 1,500 fish were harvested after that date and the last delivery was reported on August 9. The final commercial catch of pink salmon in Tutka Bay Subdistrict this season, including both seine and setnet catches but excluding hatchery cost recovery, was only 41,600 fish (Table 5). A total of 276,000 pinks were sold by CIAA for cost recovery, with an additional brood stock harvest of 67,300 fish (Table 9). The pink salmon escapement of 26,650 fish (Table 5, Appendix Table 24) into Tutka Creek exceeded the desired goal of 10,000 fish, but was once again assumed to include a high proportion of males discarded during hatchery egg-take operations.

Returns of wild pink salmon stocks to other systems in the Southern District were also very weak as indicated by ground survey escapement counts and set gillnet catch per unit effort data for the Seldovia Bay and Barabara Creek Subdistricts. No seining was allowed in the Port Graham and Seldovia Bay Subdistricts again in 1992. Despite the season-long closures, pink escapements failed to approach the lower end of the desired ranges in these two systems (Table 5, Appendix Table 24).

A harvestable surplus of pink salmon at Humpy Creek was also expected this season, however ground surveys indicated a cumulative escapement of only 1,100 fish through July 24. A closure of the Halibut Cove Subdistrict was announced for August 4 to reduce interceptions and bolster the escapement of pink salmon bound for Humpy Creek. At the same time waters of the China Poot Bay

Subdistrict south and east of the Kachemak Bay Wilderness Lodge were closed to seining to protect natural pink salmon returns to China Poot Creek. The Humpy Creek Subdistrict was never opened to commercial fishing during 1992. With an escapement goal of 25-50,000 fish for Humpy Creek, the estimated escapement of 14,900 pink salmon marked the second consecutive year of poor escapements to this stream (Appendix Table 24).

Other Species

Southern District chum salmon returns were very poor for a third straight year. Only 1,900 chum salmon were harvested (Table 6), just 28% of the 20-year average for the district and the lowest total since 1976 (Appendix Table 21). Set gillnets accounted for the bulk of the harvest (Table 1) with 37% of the district-wide catch landed in the Seldovia Bay Subdistrict (Table 6).

Although minor in total numbers of fish, the majority of the Southern District chinook harvest usually consists of incidental catches of adult fish returning to three separate enhancement projects. The 1992 harvest of 1,850 chinooks was the second highest on record for this district (Appendix Table 12). The coho salmon harvest of 1,300 fish was the lowest since 1977, representing less than one-third of the recent year (1982-91) average (Appendix Table 17).

Kamishak Bay District

Sockeye Salmon

The entire Kamishak Bay District opened to salmon seining by regulation on Monday, June 1, on the regular schedule of two 48-hour fishing periods per week. However, a weak and slightly late sockeye return to Mikfik Creek in the McNeil River Subdistrict resulted in no catches during the first week's opening. The first

landings were reported on June 8 and 9 when 3,700 sockeyes were delivered, but very few fish had moved into McNeil Lagoon or into the lower part of Mikfik Creek by that date. The seven fishermen targeting this return had subsequently decided the run was weak and moved to other areas. The next aerial survey, conducted on June 19, proved to be the peak individual aerial estimate of sockeye escapement into Mikfik Creek at 6,580 fish, representing the upper end of the desired escapement range. By the time the fleet returned to this area, the run was effectively over and only 300 additional sockeyes were taken in the McNeil River Subdistrict. The final estimated Mikfik Lake sockeye escapement was 7,800 fish, just 11% higher than the upper end (7,000 fish) of the desired escapement range (Table 3, Appendix Table 23).

With the relatively minor late June catches of sockeye in the McNeil River Subdistrict, seiners shifted their efforts to the Kamishak and Douglas River Subdistricts. Normally effort would be directed towards the Chenik Lake sockeye return, however CIAA cost recovery activities, expected to occur during the early part of the run, kept most fishermen from prospecting in the Chenik Subdistrict. Sockeye catches at "Silver Beach" in the Douglas River Subdistrict proved to be fair for the nine-boat fleet with about 7,000 fish landed between June 23 and July 7.

Preseason management strategy for the Chenik Subdistrict, as outlined in the Crooked Creek AMP, was designed to achieve the CIAA sales harvest goal of \$42,200 at the beginning of the run so the fleet could work the area uninhibited for the remainder of the season. The preseason average price for sockeyes was projected to be \$1.00 per pound, and at an average weight of 4.0 pounds per fish, CIAA needed to harvest approximately 10,550 sockeye salmon in order to achieve the revenue goal at Chenik. In order to promote high quality and allow cost recovery to occur early in the run, the

Chenik SHA (Figure 5) was closed to the common property fishery and opened to cost recovery harvest on a continuous basis beginning June 15.

Sockeyes first began to show at Chenik in late June. The first cost recovery effort on July 3 resulted in a harvest of 1,700 fish. By this time, the average price for sockeye salmon had escalated to \$1.35 per pound and a revised total of approximately 7,800 fish was required to meet the revenue goal. Subsequent buildup of fish in Chenik Lagoon was slow, and because CIAA desired to attain the remainder of the cost recovery harvest at one time to minimize both expenses and logistical problems, the next effort at cost recovery was delayed. However, concurrently the sockeye returns to Upper Cook Inlet were rapidly building, and the buyer with the original Chenik cost recovery contract declined to send a tender to Kamishak Bay. Fish had built to adequate levels for a second cost recovery harvest but a new buyer had to be secured. Hasty negotiations resulted in an agreement with another processor, and the next cost recovery harvest on July 11 netted about 6,300 fish, bringing the cumulative revenue at Chenik to \$38,150. A final cost recovery effort on July 13 resulted in a catch of just under 800 fish, which brought the final revenue total at Chenik to \$42,900, slightly more than the goal of \$42,200.

Because the cost recovery goal was achieved, the entire Chenik Subdistrict was reopened to commercial seining five days per week beginning July 16. The closed weekend period was intended to afford some limited protection for escapement purposes. Even though the majority of sockeye salmon returning to Chenik Lake were produced from the Crooked Creek Hatchery stocking project, a natural spawning component is maintained by allowing an escapement of 10,000 fish into the lake. Just prior to the reopening of the subdistrict to commercial fishing, escapement past the Chenik Lake

weir stood at about 7,600 fish. The final escapement count totalled 9,300 sockeyes when the weir project was terminated on July 30.

Nearby Kirschner Lake in the Bruin Bay Subdistrict is the site of another sockeye salmon lake stocking project where a steep falls at the beach prevents any escapement. The forecasted harvest for fish returning to this site was 40,000 fish in 1992. The first significant sockeye catches of the season at Kirschner Lake occurred on July 13, and relatively good catch rates prevailed throughout the remainder of July, averaging nearly 2,500 fish per day. Catch and effort peaked on July 20 with a catch of over 7,000 sockeyes taken by 10 vessels. Final harvest in the Kirschner Lake Section of the Bruin Bay Subdistrict was 40,000 sockeyes (Table 3).

Pink Salmon

Preseason pink salmon harvest projections for the Kamishak Bay District were modest, with returns to Bruin River and Ursus and Rocky Cove systems having the most potential for fulfilling the harvest forecast of 47,000 fish. However, early aerial surveys of major systems quickly indicated that pink returns were either extremely weak or very late. Through July 26, the peak individual aerial survey revealed less than 1,000 pinks into Bruin River, while the peak survey of the season at Brown's Peak Creek a day earlier showed only 4,000 fish in that system. Through the end of July, Sunday Creek in Rocky Cove contained less than 200 pinks. As all three aforementioned systems have escapement goals of 10,000 fish or more, the 1992 pink salmon returns were virtual failures in the Kamishak Bay District. This fact, combined with suppressed pink salmon prices and low market demand for this species, resulted in no directed effort for pinks and relatively insignificant incidental catches. The total harvest of 2,600 pinks was the fourth lowest in the Kamishak Bay District over the last 10 years

and just 4% of the long term average (Appendix Table 18). Escapements fell short at all monitored systems (Appendix Table 24).

Chum Salmon

Final chum salmon catches for the entire Kamishak Bay District totalled just over 20,000 fish, the highest harvest during the past four years but still less than half of the 20-year average (Appendix Table 21). Although catches of sockeye salmon in McNeil Subdistrict were poor during late June, catches of chums began to increase, with over 2,000 fish taken on June 23 and 25, indicating that chums were arriving in the area. However, the estimated chum salmon escapement into McNeil River on June 24 was only 176 fish, less than 1% of the low end of the escapement range. Effort in the area at the time was capable of suppressing escapement into the river, which had failed to achieve its escapement goal for the previous two years. As a result, the McNeil River Subdistrict was closed on June 29 in an attempt to bolster early chum escapement into McNeil River. This strategy was apparently effective as in-river aerial escapement estimates began to increase almost immediately, continuing to rise throughout July. However, with an escapement goal of 20,000 to 40,000 chums for this system, escapement levels never were sufficient to warrant reopening the subdistrict. The final escapement estimate into McNeil River was just over 19,000 chums (Appendix Table 25), while the final catch for the McNeil River Subdistrict was slightly over 2,000 chums (Table 6).

In the southern portion of the Kamishak Bay District, the late June closure of the McNeil River Subdistrict dispersed moderate effort to the Douglas River Subdistrict. Sockeye catches remained relatively steady there into mid-July. As the sockeye catches declined, chum catches began to increase. Several vessels were targeting on chums most likely destined for the Douglas River as

well as other Kamishak Bay systems such as the Big and Little Kamishak Rivers, McNeil River, and perhaps more northerly streams. Chum catches in this subdistrict continued into mid-August, with a final harvest of 12,500 chums (Table 6).

Very little effort specifically targeting chum salmon was known to occur elsewhere in the Kamishak Bay District during 1992. Fleet rumors suggested a large buildup of chums in the Iniskin Bay Subdistrict in late July. Subsequent effort netted only 200 fish, and a comprehensive (helicopter) survey on July 29 failed to locate any significant quantities of chums in the stream or cut in subdistrict waters. Some minor fishing effort occurred in Rocky Cove, Ursus Cove, and Kamishak River Subdistricts, but minimal harvests curtailed this effort.

Chum salmon escapements into most Kamishak Bay systems failed to reach their established goals (Appendix Table 25). However, the early closure of the McNeil River Subdistrict, combined with the conservative fishing schedule of two 48-hour weekly fishing periods in other major chum areas throughout the season, assured that the bulk of the chum returns successfully avoided the fishery and returned to their natal streams.

Other Species

Chinook salmon harvests in the Kamishak Bay District have historically been insignificant (Appendix Table 12). On the other hand, coho harvests within the district have at times been substantial, sometimes providing fishermen with a late season surge in catches. However, early indications suggested weak returns, and subsequently little effort was extended towards this species. The 1992 coho harvest total of 1,500 fish was well below historic averages for this district (Appendix Table 17).

Outer District

Sockeye Salmon

Outer District sockeye harvests have historically been based on natural returns to the Delight and Desire Lakes systems in East Nuka Bay Subdistrict. A lake stocking project in the Port Dick area during the late 1980's provided additional fish for harvest during the latter part of the decade and into the early 1990's. Preseason projections forecasted a harvest of up to 29,000 fish for the entire district, but returns were weak and the actual harvest totalled only 600 fish (Table 3, Appendix Table 13), the lowest total since 1975.

Although fish were spotted aurally beginning in late June at both Delight and Desire Lakes, numbers were small and no major buildup was observed. Consequently, the subdistrict was not opened to fishing so that escapements could continue unimpeded. Aerial escapement estimates peaked at Delight Lake in mid-July and declined thereafter, with a final escapement estimate of 5,900 fish, slightly over half the goal of 10,000 fish (Appendix Table 23). At Desire Lake, escapements continued to build, albeit slowly, throughout July, peaking on the last day of the month and resulting in a final estimated escapement of 11,900 fish, or 19% over the established goal of 10,000 sockeye for this system.

An interesting phenomenon has been observed at a third lake system known as Ecstasy (or Delectable) Lakes in East Nuka Subdistrict. Located near the head of the East Arm of Nuka Bay, the two-lake system is relatively new, forming during the late 1970's and early 1980's by a receding glacier. This fact was substantiated by reviewing charts and maps drawn prior to the mid-1980's, as no lakes are indicated at the site of the present bodies of water.

Prior to the 1980's, no salmon were known to utilize the system, but in approximately 1989, during a routine aerial survey, adult sockeye salmon were documented in the system by the staff for the first time. Each year since then, aerial surveys have revealed sockeye salmon in the system, with a peak aerial count of 1,000 fish occurring during 1992. Little is known of the origins of this return, although at ADF&G's request, limited sampling of the adult return occurred this year by University of Alaska students already studying the site. Otoliths and length measurements were taken from 41 post-spawning carcasses, indicating nearly 60% large 3-ocean fish (six years old).

At Port Dick, an expected return of up to 9,000 hatchery-produced sockeyes failed to materialize, and despite opening a small area of the South Section of the Port Dick Subdistrict on July 2 to target on this return, the minor effort resulted in the harvest of only 400 sockeye. Because stocking of Port Dick Lake was discontinued after 1989, 1992 was the last year of expected returns to this stocking site.

Pink Salmon

Harvest forecasts for pink salmon in the Outer District were fairly optimistic (over 335,000 fish), with Port Dick and Nuka Bay holding the best prospects for surplus returns. As was the case in other LCI districts, however, returns to all systems were poor and harvests were inconsequential. At a total of only 146 fish, the Outer District pink harvest was the second lowest ever recorded (Appendix Table 18).

For the first time, a new management strategy was devised for the Port Dick area based on input from fishermen over the winter of 1991-92. Concerns over quality led to a plan whereby the outer areas of the subdistrict would be opened on a calendar date earlier than the traditional opening date (normally openings were based on

stream escapement rates and fish abundance in saltwater). It was hoped that opening areas further away from freshwater systems would allow the fleet the opportunity to harvest higher quality fish before they became freshwater marked, thus reducing their market value. Despite having this plan in place for the 1992 season and opening the outer waters of the Port Dick Subdistrict on July 13, the run strength was so weak that the few boats prospecting the area were unable to locate any significant amounts of fish, as evidenced by a total of just two landings from the Outer Section of the Port Dick Subdistrict for the entire season. Only minor effort occurred in the South Section of the subdistrict as well, with the first of four total landings reported on July 18 and the last on August 8.

Despite the lack of fishing pressure, only Island Creek in the Port Dick Subdistrict achieved its pink salmon escapement goal in 1992 (Appendix Table 24). Most other systems in the Outer District fell short of the pink escapement goals by 50% or more. Escapement levels never justified any other openings in the Outer District during 1992.

Chum Salmon

Chum salmon numbers have declined dramatically in the Outer District since the peak harvest years of the late 1970's and early 1980's. Large returns were not expected in 1992 due to a succession of poor returns over the past several seasons. No specific commercial openings targeting chum salmon occurred in 1992, and the harvest of 181 fish was the second lowest on record (Appendix Table 21).

Escapements into the three monitored chum salmon systems in the Outer District were mixed. Port Dick (Head End) Creek surpassed its escapement goal of 4,000 chums with an estimated 5,400 fish into the system (Appendix Table 25). But both Island Creek in the

Port Dick Subdistrict and Rocky River in the Rocky Bay Subdistrict failed to reach their goals.

Eastern District

Sockeye Salmon

The Eastern District had the potential for harvestable surpluses of sockeye salmon in Aialik and Resurrection Subdistricts during 1992, with a preseason projection of up to 36,000 fish district-wide. However, the actual total catch amounted to only 400 sockeye (Appendix Table 13), the lowest total since 1980. The entire catch was taken incidentally during late season efforts targeting pink salmon in Aialik Subdistrict (Table 3).

At Bear Lake, near Seward in the Resurrection Bay Subdistrict, sockeye enhancement activities by CIAA fostered optimism for a harvest of up to 20,000 fish. Based upon the expected increase of sockeyes returning to this system, a Resurrection Bay Management Plan was drafted during the winter of 1991-92 to allow the seine fleet the opportunity to target on this run at a relatively early date in the outer reaches of Resurrection Bay in order to promote product quality. An early run timing was presumed for this enhanced run since brood stock (from Big River in Upper Cook Inlet) had a documented run timing peaking in early June. The entire Resurrection Bay Subdistrict, up to a point one mile due south of Cape Resurrection and Aialik Cape, was opened to seining by emergency order on a schedule of two 40-hour fishing periods per week, beginning on Monday, May 11.

When the area first opened, no effort occurred in the outer areas of the subdistrict as the fleet adopted a "wait-and-see" attitude, hoping to locate fish nearer to the head of the bay before assessing run strength. A few fishermen actively scouted the head of the bay, and although several actual sets were made, only a

handful of fish were caught and kept for personal use. No further effort occurred, and on July 13, as set forth in the management plan, the Resurrection Bay Subdistrict was closed to fishing to protect indigenous stocks of pink and chum salmon beginning to return to area streams. The sockeye run to Bear Lake was, in essence, a failure, with escapement counts at the Bear Creek Weir facility, operated by CIAA, amounting to less than 2,000 fish for the entire season. Interestingly, despite the selection of a brood stock with early run timing, sockeye escapement actually continued into the month of August.

At Aialik Lake in Aialik Subdistrict, aerial surveys were begun on June 23, but only 20 sockeyes were observed on that first flight. Subsequent flights over the next three weeks revealed a peak of just 400 fish, suggesting a weak return. Despite low numbers of fish, the Aialik Subdistrict was opened to seining on a schedule of two 48-hour fishing periods per week beginning July 6, in hopes of gaining additional information on run strength due to the weather-related problems encountered in aerially surveying this remote system. Waters of Aialik Lagoon were not opened to fishing, affording substantial protection to returning fish, especially when runs are weak, since successful seining in waters outside the lagoon is difficult unless returns are large. Run strength was confirmed when the resulting effort netted only six sockeyes, and no further effort or harvest occurred.

Aerial surveys conducted at Aialik Lake over the course of the season, under primarily marginal conditions, yielded a peak estimate of 1,750 sockeyes in the system, less than the desired escapement range of 2,500 to 5,000 fish. However, because no fish were harvested commercially and thus no catch samples were obtained inseason, a technician was dispatched to the lake near the end of August to obtain otolith samples for aging. Survey conditions at the time of this sampling were nearly perfect, and both the technician and the float plane pilot (experienced at spotting

salmon) had excellent opportunity to estimate numbers of fish. Based on their counts of both live fish and carcasses, the final escapement estimate into Aialik Lake was increased to 2,500 sockeye (Appendix Table 23), achieving the lower end of the escapement range for this system.

Pink Salmon

No harvest of pink salmon was forecasted for the Eastern District during 1992 as returns there in recent years have been weak. Limited aerial surveys of the district in 1992 reflected the weak pink run strengths experienced throughout the rest of the management area, and the Resurrection Bay Subdistrict was kept closed to fishing for pinks.

Aialik Subdistrict, originally opened on July 6 for sockeye salmon, was never closed after the sockeye run was effectively over. A number of vessels travelled to this open district later in the season in hopes of fishing the outer areas for pink salmon as had been successfully done during 1991. The staff decided to leave the area open in an attempt to gain important information through commercial catch sampling on the origins of pinks caught in the outer waters of Aialik Bay.

The first late-season catches of pink salmon in Aialik Bay occurred on August 10 when five vessels reported landings totalling 4,200 fish. Catches peaked on August 14 when 22,200 pinks were landed by six vessels. Harvests declined thereafter, with the last reported landing on August 25. Total pink catch in the Aialik Subdistrict was 60,000 fish for the 1992 season (Table 1).

Fish from the Aialik Bay pink fishery were delivered to Seward, where they were screened by ADF&G technicians on several different occasions to recover tags which had been applied at various hatcheries in Prince William Sound (PWS). Results of this sampling

indicated substantial numbers of pink salmon bound for PWS, as shown in the following table:

Fishing Period	Hours	Pink Catch	Date Sampled	# Fish Sampled	% Scanned	Clips Recov'd.	Tags Recov'd.
8/10-12	48	14,801					
8/13-15	48	28,643					
8/17-19	48	11,379	8/19	2,352	20.7%	9	4
8/20-22	48	4,767	8/23	712	14.9%	5	3
8/24-26	48	417					
TOTALS	240	60,007		3,064	5.1%	14	7

The seven recovered tags originated from three different pink salmon hatcheries in PWS. Ongoing tag recovery research conducted in PWS suggests that every tag recovered represents approximately 575 fish of Prince William Sound Aquaculture Corporation (PWSAC) hatchery origin. Such numbers provided hard evidence that the seine fishery operating in the outer areas of Aialik Subdistrict intercepted pink salmon primarily bound for PWS.

Other Species

Chum salmon are the only other commercially important species in the Eastern District, but harvests during the previous three years have been dismal. This season's harvest was equally poor, with a total of only 86 chums harvested, the second lowest total in the last 10 years (Appendix Table 21).

SUBSISTENCE AND PERSONAL USE FISHERIES

Kachemak Bay Subsistence/Personal Use Fishery

The Southern District (Kachemak Bay) fall coho salmon set gillnet fishery dates back prior to statehood under varying names, most recently being known as a "personal use" fishery. The target species has been coho salmon, with returning fish a mixture of natural stocks bound primarily for the Fox River drainage at the head of Kachemak Bay and adults returning to enhancement sites at Caribou Lake and the Homer Spit. Due to the absence of suitable spawning habitat at both enhancement sites, all adult fish resulting from the fry stocking projects are intended for harvest and have contributed significantly to both the gillnet fishery and sport fisheries. Catches in the gillnet fishery have been allowed to exceed the published guideline level during some recent years to permit the harvest of these additional fish.

When the Alaska Board of Fisheries considered this fishery during their 1990 deliberations, members expressed concern for the potential to overharvest natural components of the returns. Therefore, several important changes were enacted. First and foremost, the Board labelled the Southern District fishery as "subsistence" based on the "customary and traditional" criteria they had earlier established in other areas, thus giving the fishery a priority over sport, commercial, and personal use groups. After reviewing historical catches in the fishery, the Board directed the Department to manage for a guideline harvest range of 2,500 to 3,500 coho salmon for the entire fishery, an amount they felt significant for participants yet conservative enough to provide adequate protection to natural runs. Finally, the Board directed the Department to close a portion of upper Kachemak Bay to coho salmon fishing by all user groups coincidentally with the achievement of the guideline harvest level and closure of the gillnet fishery.

Despite the Board's determination that this fishery be considered a "subsistence" fishery, a 1991 legal challenge resulted in a court ruling that invalidated the subsistence regulations adopted by the Board. The Department was then forced to adopt an Emergency Regulation in order to prosecute the 1991 fishery under the Personal Use regulations formerly governing the fishery. In May of 1992, a higher court struck down the original 1991 court ruling, thus returning the Kachemak Bay fishery to a "subsistence" status.

Most regulations governing the 1992 fishery remained unchanged from previous years. The regulatory opening date was August 16. Legal gear was limited to single set gillnets not exceeding 35 fathoms in length, 45 meshes in depth, and 6 inches in mesh size. A permit from the Homer office, restricted to Alaska residents only, was required, with seasonal limits set at 25 salmon per head of household and 10 additional salmon per each dependent. Scheduled weekly fishing periods were from Monday 6:00 a.m. until Wednesday 6:00 a.m. and Thursday 6:00 a.m. until Saturday 6:00 a.m.

The number of subsistence permits issued for the 1992 fishery (365) was the lowest since 1978 and only slightly greater than the average of all years since 1969 (Appendix Table 26). The fishery opened on August 17. Prior to the opening, the Department requested voluntary daily reporting from each permit holder, and these voluntary inseason catch reports, combined with experience from previous years' fisheries, indicated that the lower end of the harvest range would be achieved by the end of the second regularly scheduled 48-hour fishing period. The closure was announced to coincide with the end of this period on August 22. A total of 96 hours fishing time (two regularly scheduled 48-hour fishing periods) was allowed, making the 1992 fishery the second shortest on record. Catch figures based on 350 permit holders reporting (96% of the total) were as follows: 2,277 coho; 643 pink; 63 sockeye; 21 chum; and 5 chinook (Appendix Table 26). The 1992 coho catch represents the lowest total since 1979 in this fishery.

The major factor affecting the lower number of permits issued for the Southern District subsistence fishery in 1992 was the availability of similar fishing opportunities in Upper Cook Inlet and the strength of the targeted returns in those fisheries. Many people who normally fish the Southern District for cohos opted instead to fish Upper Cook Inlet for sockeye salmon based on the strong returns to that management area.

The low coho catches in the 1992 subsistence fishery are a reflection of both run strength and run timing. The limited assessment of coho returns in Lower Cook Inlet, primarily the monitoring of commercial and sport harvests, indicated only average to weak returns. Additionally, the coho run appeared to be a few days to one week later than normal. The short duration of the fishery and the late run timing combined to afford an extra measure of protection to natural segments of the coho returns. Because of the late run timing, allowing additional fishing time could have easily resulted in an unacceptably high harvest rate on the natural returns, especially considering the suspected weakness of the runs. An aerial survey flown to assess coho escapement in the Fox River drainage in September documented relatively strong escapement (approximately 850 fish) by historical standards in Clearwater Slough (Table 4), a major coho salmon spawning tributary used as a coho "index" stream in the Southern District. This suggested that curtailment of subsistence gillnet fishing and closure of the upper bay to sportfishing allowed a significant portion of the natural Fox River coho return to avoid these two fisheries and enter the drainage to spawn.

Several important issues were brought to light by the 1992 Southern District subsistence fishery, mostly revolving around the coho enhancement efforts in Kachemak Bay. Coho salmon produced by stocking have changed the nature of the fishery by shifting the areas considered most productive and consequently altering the intensity of effort in these areas. Returns from enhancement

projects have contributed significantly to harvests in the subsistence gillnet fishery, particularly in the vicinity of the Homer Spit, thus making the Spit probably the most sought after fishing area in the entire bay. The congestion of nets on the Spit during the first two days of the 1992 fishery led to blatant violations of the regulation requiring a 600 foot minimum distance between nets and resulted in the confiscation of several nets.

Increased production from enhancement has also impacted the duration of the subsistence fishery. Prior to enhancement, the fishery was usually allowed to proceed from the regulatory opening on August 15 until the regulatory closure on September 15, and most participants had ample opportunity to obtain their fish over this time period. It followed, then, that late run timing in a given year had little effect on catches since effort could be arranged around the peak of the run. In recent years, however, intense competition for this resource has concentrated effort, and the subsequent harvest, at the start of the season. This has been most notable in the Homer Spit area due to the easy access and the attraction of the enhanced production. As a result, catches over the past two seasons have approached the guideline harvest range within the first week after opening, effectively eliminating those fishermen who either are unable to fish during the opening week or who simply fail to secure a fishing site during that week. Additionally, for fishermen whose catches are comprised primarily of natural stocks, such as those fishing the south side of Kachemak Bay, a short season coupled with late run timing, as occurred in 1992, means few if any cohos in their catches.

Gillnet congestion on the Homer Spit also apparently created navigational hazards around the Homer Small Boat Harbor. In the clamor for fishing sites near the enhancement lagoon, some fishermen demonstrated questionable judgement in placement of their

nets, causing the Homer Harbormaster and the Homer Port and Harbor Commission to warn that potential for vessel accidents is increased while the fishery is open.

English Bay/Port Graham Subsistence Fishery

The second major subsistence fishery in Lower Cook Inlet benefits residents of the villages of English Bay and Port Graham, located approximately 21 nautical miles southwest of Homer on the south side of Kachemak Bay (Figure 2). Most fishing occurs within close proximity to the respective villages and targets on sockeye salmon returning to the English Bay Lakes system. Some additional fishing also occurs in Koyuktolik ("Dogfish") Bay, located about seven nautical miles south of English Bay, targeting non-local stocks of chinook salmon.

The sockeye salmon stock at English Bay Lakes has been severely depressed for much of the last decade, with returns failing to achieve the minimum escapement goal for seven consecutive years since 1984. As a result, the Port Graham Subdistrict, which includes both Port Graham and the English Bay Section, was closed again in 1992 to commercial, sport, and subsistence fishing beginning June 1 to protect returning sockeye adults. These areas remained closed to subsistence fishing until July 17, when the sockeye run was effectively over, while the commercial fishery remained closed for the entire season. Additionally, the Koyuktolik Bay area was also closed to subsistence fishing beginning June 1 in an effort to provide added protection to English Bay sockeyes, but arguments by village residents that little interception of sockeyes would occur because large mesh gear was being employed to target chinook salmon prompted the staff to reopen Koyuktolik Subdistrict on June 5. The final 1992 escapement estimate for English Bay Lakes, obtained from weir counts, was 6,400 sockeyes, less than the minimum established goal of 10,000 fish (Appendix Table 23).

Closures of the Port Graham and English Bay areas to subsistence fishing resulted in significantly reduced catches of sockeye salmon at both villages compared to historical averages (Appendix Tables 28 and 29). The weak natural pink salmon return to the Port Graham River, as well as the failure of the first year return of pinks to the new Port Graham Hatchery, also caused decreased subsistence catches of this species after the areas reopened to fishing in mid-July. The only significant increase in traditional catches occurred in the chinook salmon harvest by the residents of English Bay, probably due to targeted effort in Koyuktolik Bay.

ENHANCEMENT AND REHABILITATION

Introduction

Fisheries enhancement has played a major role in LCI salmon production during recent years. Natural adult salmon returns to the LCI area continue to demonstrate wide fluctuations, often the result of environmental impacts such as flooding or ice scouring on spawning grounds. Since their inception in the mid-1970's, enhancement and rehabilitation projects have made significant contributions to both commercial and sport fishing harvests. These contributions have historically ranged from 24% to 90% of the entire LCI commercial salmon harvest and are expected to remain high in future years.

FRED Division and CIAA projects provided 76% (520,200 salmon) of the total 1992 LCI commercial harvest of 686,400 fish. The Leisure/Hazel, Chenik, Port Dick, and Kirschner Lakes sockeye salmon enhancement projects produced approximately 82% (145,100 fish) of the total LCI sockeye harvest of 176,600 fish in 1992. Tutka Lagoon Hatchery production, along with the FRED/Cook Inlet Seiners Association (CISA) cooperative rearing and remote release

project at Halibut Cove Lagoon, accounted for 78% (373,500 fish) of the 1992 LCI commercial pink salmon harvest of 479,800 fish.

Using average weights per fish and average prices per pound in LCI, the estimated contribution of FRED/CIAA-produced salmon was approximately three-fourths (\$1,105,200) of the \$1.466 million total value of the 1992 LCI commercial salmon harvest. Over 15% (\$227,800) of the total exvessel value of the fishery was utilized for hatchery cost recovery purposes. A brief description of the current enhancement projects in LCI follows.

Tutka Lagoon Hatchery

The Tutka Lagoon Salmon Hatchery/Rearing Facility was constructed in 1976 with an initial production capacity of 10 million salmon eggs, but has been expanded to a current capacity of 50 million eggs. Pink salmon have been the primary species produced at the hatchery, with some secondary effort directed at chums. Work has recently been initiated on the feasibility of sockeye production at Tutka Hatchery.

In 1992 the pink salmon produced by Tutka Lagoon Hatchery totalled approximately 471,300 fish returning to the hatchery and it's various release sites (Table 9). The estimated 1.4% overall survival rate was the fourth lowest in the facility's history. The reasons for the poor pink salmon returns to LCI enhancement sites in 1992 are not clear at this time. However, very weak pink salmon returns were experienced by most natural systems in the LCI management area as well as those in the Kodiak and Prince William Sound management areas during 1992.

The commercial harvest, including cost recovery, of 315,350 pink salmon from Tutka Bay and Lagoon (Table 9), accounted for approximately 76% of the Southern District pink harvest and 66% of the entire LCI commercial pink salmon harvest. Pinks utilized for

hatchery cost recovery purposes from the Tutka Bay Subdistrict totalled 276,000 fish, worth approximately \$212,800.

Leisure and Hazel Lakes Sockeye Salmon Stocking

Leisure Lake, also called China Poot Lake, historically was a system barren of sockeye salmon. A study initiated in 1976 involved the stocking of hatchery produced sockeye salmon fry to determine optimum stocking levels prior to and after lake enrichment through fertilization. Because a barrier falls below the lake prevents upstream migration, and therefore precludes any adult spawning, it is desirable to harvest all returning adult fish in the terminal harvest area. A similar sockeye stocking program was initiated in Hazel Lake, located approximately three miles south of Leisure Lake, beginning in 1988. Since the initiation of these projects, nearly 800,000 adult sockeye are estimated to have returned as a result of the stocking programs, making a significant contribution to the commercial sockeye harvests in the Southern District (Appendix Table 15).

Because of the close proximity of the two terminal harvest areas, and the absence of a mark/recovery program, adult returns to Leisure and Hazel Lakes cannot be identified separately through sampling within the commercial catches and are therefore presented as a combined total. The total combined sockeye returns to Leisure and Hazel Lakes in 1992 was estimated to be 93,600 fish (Figure 5, Appendix Table 15). The cumulative commercial harvest of 89,800 fish comprised 84% of the Southern District and 51% of the total LCI sockeye salmon harvest.

Approximately 2.0 million sockeye salmon fry were released into Leisure Lake in 1992, the ninth consecutive year of high-density stocking, while an additional 1.0 million fry were released into Hazel Lake (Appendix Table 30). The fry for both projects originated from Glacier Flat (Tustumena Lake) brood stock.

Halibut Cove Lagoon Salmon Enhancement

Pink Salmon

Pink salmon enhancement at Halibut Cove Lagoon was initiated in 1986 as a cooperative program between CISA, CIAA, and ADF&G. Pink salmon fry are transported from Tutka Hatchery to Halibut Cove Lagoon where they are held in floating net pens and fed for 30 days before release. The goal of this project is to disperse fry releases from the Tutka Hatchery over more underutilized rearing areas. It also serves to disperse the commercial seine fleet over larger areas. Since there is no suitable spawning habitat available at Halibut Cove Lagoon, all returning adult fish are targeted for harvest in the commercial seine and set gillnet fisheries.

The 1992 adult return from the 1991 release of six million pink salmon fry was estimated at 58,200 fish, representing a survival rate of approximately 1%. Previous tagging studies have shown that up to 15% of the fry released from Halibut Cove may have imprinted and returned to Tutka Creek, the original parent stream. The reasons for this year's poor pink salmon survival are unknown, but the 1992 return was very disappointing considering that past ocean survival rates exhibited by adults returning to this site have approached 10%. Similar to 1991, six million pink fry were released in Halibut Cove Lagoon during 1992.

Chinook Salmon

The chinook salmon enhancement project at Halibut Cove Lagoon involves the release of chinook salmon smolts, with the objective of increasing sport fishing opportunities in Kachemak Bay. This is the oldest and one of the most popular sport fishing enhancement projects in LCI. An estimated 3,000 adult chinook salmon returned to Halibut Cove Lagoon in 1992.

Although adult returns from the Halibut Cove Lagoon stocking program are not intended for commercial harvest, there is incidental harvest of these chinook salmon in the commercial set gillnet and seine fisheries, creating concern for all user groups. In 1992 the incidental harvest by commercial fishermen was estimated at 1,040 fish, or about one-third of the total return. This was higher than the previous year's percentage but similar to the long-term average commercial catch rate for Halibut Cove Lagoon bound chinooks. The bulk of the incidental commercial harvest was by set gillnets operated in the Halibut Cove Subdistrict, accounting for an estimated 690 fish, or about 23% of the entire hatchery-produced run this season. The remaining 350 chinook salmon were harvested incidentally during the commercial pink salmon seine fishery within Halibut Cove Lagoon. This terminal pink salmon fishery occurs near the end of the chinook return.

It should be noted that many chinook incidentally harvested while seining during the early part of the pink return were voluntarily released by the fishermen. A significant number of the commercially harvested chinook were only retained towards the end of the chinook salmon run after many sport fishermen had diverted their efforts to other fishing areas and species. These fish, mainly small 2-ocean age chinook, would probably not have been harvested by anglers and cannot spawn at Halibut Cove Lagoon due to a lack of suitable spawning habitat.

Chenik Lake Sockeye Salmon Stocking

Chenik Lake, located in Kamishak Bay, historically was an excellent sockeye producer prior to the 1940's when annual runs approached 150,000 fish. Since that time, however, sockeye runs declined dramatically, forcing a complete closure of the Chenik area fishery beginning in 1952. By the mid-70's the annual return to this system was less than 500 fish.

In 1978 FRED Division initiated a program to re-establish the sockeye returns and subsequently increase commercial fishing opportunities in the Kamishak Bay area. Sockeye fry from Crooked Creek Hatchery have been annually stocked in Chenik Lake since that time, and a fish pass was developed at the intertidal mouth of Chenik Creek, alleviating a partial migrational barrier. Since 1987, lake enrichment has occurred through the application of liquid fertilizer, but not on an annual basis.

Increased escapements in the early 1980's augmented subsequent production, and the Chenik area was reopened to commercial fishing. Returns have produced up to 50% of the total LCI commercial sockeye harvest in some recent years, approaching the historical record high runs of the 1930's.

The 1992 commercial harvest of Chenik Lake sockeye salmon totalled only 14,400 fish (Figure 6, Appendix Table 16), about 12% of the preseason projection for this system. Infectious Hematopoietic Necrosis (IHN), a viral disease commonly affecting juvenile salmon and trout, was documented in the Chenik system during the 1991 and 1992 smolt outmigrations. It is suspected of causing increased mortality to young sockeyes and therefore reducing the adult returns. A thorough investigation of the Chenik Lake sockeye stocking project was initiated during the winter of 1992-93, but recommendations have yet to be made. Adult escapement into Chenik Lake was once again enumerated through the use of a counting weir at the lake outlet in 1992 and totalled approximately 9,300 fish, nearly achieving the 10,000 fish goal (Appendix Table 23).

English Bay Sockeye Salmon Rehabilitation

The English Bay Lake system has the only significant natural run of sockeye salmon in the Southern District of LCI. Unfortunately, the English Bay sockeye returns have declined in recent years to their lowest recorded levels. Sockeye escapements since 1985 have ranged

from 2,500 to 7,000 fish, well below the 20-year average of 7,500 fish (Appendix Table 23). The 1992 escapement, tallied through the use of a counting weir operated by North Pacific Rim, totalled 6,400 fish. Optimum escapement for this system is estimated at 15,000-20,000 sockeyes.

The recent declining trend in the English Bay sockeye run has resulted in a very restrictive management strategy for this area. The commercial, sport, and subsistence fisheries have been closed for most of the last several seasons. Efforts to rehabilitate the depressed sockeye salmon stock at the English Bay Lakes system were initiated by the FRED Division with an egg take in 1989 and the subsequent release of 350,000 sockeye salmon fry in 1990. North Pacific Rim, in cooperation with the village of English Bay, the Bureau of Indian Affairs, and FRED Division, has since taken over this enhancement project and continued egg collections and fry stockings. During 1992, approximately 156,000 sockeye fry were released directly into one of the larger lakes while another 85,000 larger "presmolt" were released in October after a long-term pen rearing production experiment. A total of over one million sockeye eggs were collected for incubation at Big Lake Hatchery near Wasilla.

Bear Lake Sockeye Salmon Enhancement

Bear Lake, located at the head of Resurrection Bay in the Eastern District, has been the target of sockeye salmon enhancement efforts over recent years. This system has been the centerpiece of a Division of Sport Fish coho salmon enhancement program since 1962, part of which included limiting the escapement of sockeye salmon into the lake. As a result, only a small remnant run of naturally occurring sockeye salmon remained at Bear Lake. In an effort to produce increasing numbers of adult sockeyes without adversely affecting coho salmon production, as mandated by Board of Fisheries policy, CIAA undertook a sockeye stocking program beginning in 1989

with the release of 2.2 million sockeye fingerling. Since then, additional releases of both fingerlings and accelerated growth ("zero check") smolts have occurred, ranging from 1.6 to 2.4 million juvenile sockeye salmon each year (Appendix Table 30). The first year of adult returns in 1992 was a disappointment with a total of less than 2,000 fish, however this return was primarily based on the survival success of the "zero check" smolts. Subsequent returns, with contributions from both fry and smolt plants, could be significantly better.

Other Sockeye Salmon Lake Stocking

Several other LCI lakes were stocked in 1992 with sockeye salmon fry produced by Crooked Creek Hatchery. A total of five different lakes, evaluated through pre-stocking studies conducted between 1986 and 1989, were stocked with 1.50 million sockeye fry during 1992 (Appendix Table 30). The five lakes included Kirschner Lake, Bruin Lake, Ursus Lake, Upper Paint Lake, and Lower Paint Lake, all in the Kamishak Bay District.

The third year of adult sockeye returns to Kirschner and Port Dick Lakes occurred in 1992. The total return to Kirschner Lake was 40,000 sockeyes, all harvested in the commercial seine fishery (Table 3). This was the only enhanced system in LCI to achieve its preseason forecast, coming in at exactly the number predicted. At Port Dick, the return was considered a "bust", with only 420 fish returning out of a projection of up to 9,000 fish. Stocking of Port Dick Lake was discontinued after 1989, and no future adult returns are expected as a result of that project. It was encouraging to note that smolt mortality rates through the extensive waterfall outlet at Kirschner Lake may not be as high as once thought.

Paint River Fish Pass

The Paint River system in the Kamishak Bay District contains at least 40 kilometers (25 miles) of potential salmonid spawning and rearing habitat for an estimated 1,600,000 sockeye, pink, and chum salmon. The Paint River system is currently barren of salmon because of an impassible waterfall at tide line. FRED Division and CIAA initiated feasibility studies for a fishway in 1979. CIAA received State and Federal grant funds to build the fishway, completing construction in the fall of 1991. The Paint River Lakes were first stocked with sockeye fry in 1986 and annually since 1988 to test the feasibility of developing a sockeye salmon return to the fish pass project site. A total of 0.75 million sockeye salmon fry were released into the two Paint Lakes via air drop in 1992. A peak of 300 adult sockeyes was observed during aerial surveys of the Paint River mouth and Akjemguiga Cove during 1992. Because of the small numbers of returning fish, the fish pass was not opened to the migrating salmon and no freshwater escapement occurred.

New Port Graham Hatchery

In an effort to supplement natural fish production and provide increased employment opportunities in the native village of Port Graham, the Port Graham Hatchery Corporation applied for a permit to operate a private non-profit (PNP) hatchery. The application was reviewed and approved by CIAA's regional planning team and the permit was subsequently granted in September, 1992. Port Graham is located approximately 21 nautical miles southwest of Homer on the south side of Kachemak Bay (Figure 2). The hatchery had been conducting experimental egg-takes and fry releases via a scientific/educational permit since 1990. An informal preseason forecast of 18,000 adult fish returning to the hatchery in 1992 failed to appear. Although all efforts thus far have been directed

toward pink salmon, investigation into the feasibility of sockeye salmon production has also been considered.

The PNP permit allows brood stock collection from a natural run of pink salmon in the Port Graham River, at the head of Port Graham. However, the Port Graham River pink run historically has experienced significant natural fluctuations in escapements despite conservative fishing schedules, causing some concern over protection of the natural stocks. Consistent with the priority of managing for natural stocks (AS 16.05.730), a brood stock collection schedule based on the desired natural escapement into Port Graham River as well as historical escapement levels has been devised to offer maximum protection to the wild pink salmon stock during years of weak returns.

Harvest of returning hatchery stocks could potentially occur in commercial purse seine and set gillnet fisheries as well as a subsistence set gillnet fishery in Port Graham. Hatchery fish will likely intermix with wild stocks bound for the Port Graham River. Management decisions must address the effects of these various fisheries so as to afford protection to the natural stocks until adequate escapement into Port Graham River is achieved. A small natural return of chum salmon to Port Graham River also occurs, but this run has been depressed in recent years and management measures must strive to protect this species as well.

The approved Port Graham Hatchery Basic Management Plan designated a Special Harvest Area (SHA) to allow for brood stock collection and cost recovery harvest (Figure 6). The SHA was designed to provide a migration corridor on the northeast side of the bay for wild stocks traveling to Port Graham River at the head of the bay. Restricting the harvest in Port Graham to the SHA is expected to afford some limited protection to the natural spawning stocks of pink and chum salmon. Once hatchery brood stock and cost recovery requirements are met, remaining surpluses may be harvested by the

common property fishery inside the SHA. However, no guarantee of brood stock and/or cost recovery can be assumed. Fishing time will have to be restricted until the fish become spatially segregated or until adequate escapements are achieved in the river.

1993 COMMERCIAL SALMON FISHERY OUTLOOK

Sockeye Salmon

Adult sockeye salmon returns to all LCI systems could approach 284,000 fish in 1993, nearly two-thirds of which (183,000 fish) should be a result of the continuing enhancement and lake stocking projects in LCI. Beneficial results of Leisure Lake fertilization should again be evident in the 1993 sockeye returns. Based on past emigration and survival estimates from annual releases of two million fry, approximately 60,000 sockeye salmon are projected to return to China Poot Bay in 1993. An additional 30,000 sockeyes are expected to return to Neptune Bay as a result of fry releases into Hazel Lake.

The 1993 sockeye salmon harvest at Chenik Lake is forecasted to be only 10,000 fish. Despite parent brood year escapements at or near desired levels, and annual stocking of up to 3.5 million sockeye fry, the problem of IHN apparently has caused significant mortality to juvenile sockeyes and reduced the numbers of emigrating smolt from the system in recent years. As a result, the harvest forecast estimates are conservative to account for this factor.

Adult sockeye returns to Kirschner Lake have been very encouraging over the past two seasons, leading to a forecast of 30,000 fish in 1993. Bruin Lake, also in the Kamishak Bay District, has been stocked with sockeye fry since 1990, and the resulting first year adult return could reach 20,000 fish in 1993 based on return rates to other nearby enhanced Kamishak Bay systems. The Paint River

Lakes were also stocked in 1989 and 1990 with 2.0 million sockeye salmon fry each year from the Crooked Creek Hatchery. However, based on recent years' poor adult returns from similar stocking levels at this system, no harvestable surplus of fish is forecast for 1993.

The second year sockeye return to Bear Lake in 1993 is expected to be considerably better than the disappointing 1992 return and could approach 33,000 fish. However, success of this project has yet to be determined, in part due to the uncertain survival of the "zero check" smolt released into that system.

Natural sockeye returns are based solely on average historical harvests and are expected to contribute up to 101,000 fish to commercial catches in 1993. However, runs of naturally produced sockeye have not reached expectations during recent years for unknown reasons. The Southern District is expected to contribute the most to the harvest of natural stocks, while additional catches could come from the East Nuka Bay systems of Delight and Desire Lakes in the Outer District and Mikfik Lake in the Kamishak Bay District.

Pink Salmon

Harvest of pink salmon in Lower Cook Inlet during 1993 is anticipated to reach nearly 1.0 million fish, with enhanced production expected to provide over half of the total. The Tutka Hatchery, in the Southern District, is expected to contribute up to 434,000 pinks, while production from the remote release site at Halibut Cove Lagoon is projected to provide an additional 90,000 fish for harvest.

Natural spawning escapement levels into most major LCI systems were variable in 1991, contributing to a harvest projection of 451,000 naturally produced pinks throughout the entire LCI management area.

The Port Dick area in the Outer District and Bruin Bay in the Kamishak Bay District are expected to provide the greatest potential for harvestable surpluses.

Chum Salmon

Based on historical average harvests, the total LCI commercial chum salmon harvest is estimated to be as high as 121,000 fish during 1993. The projected LCI chum harvest should consist exclusively of natural production since the enhanced return to Tutka Hatchery is expected to be minimal. Several factors suggest a high potential to achieve the forecasted harvest in 1993: 1) optimum escapement levels to most major systems in 1988 and west side systems in 1989; 2) runs primarily dominated by age-5 fish; and 3) relatively high percentages of age-4 fish in the 1992 catches. However, actual harvests during the past three years have failed to meet the preseason projections by significant amounts.

The following table summarizes the projected harvest figures by species in the Lower Cook Inlet management area during 1993:

	<u>Natural</u>	<u>Enhanced</u>	<u>Total</u>
CHINOOK	NO FORECAST	^a	NO FORECAST
SOCKEYE	101,000	183,000	284,000
COHO	NO FORECAST	^a	NO FORECAST
PINK	451,000	524,000	975,000
CHUM	121,000	0	121,000
Total	673,000	707,000	1,380,000

^a Enhanced returns of these species, intended primarily for recreational fisheries, will probably contribute some amount of fish to commercial harvests.

COMMERCIAL HERRING FISHERY

INTRODUCTION

Similar to salmon, the LCI herring management area is divided into five separate fishing districts, with commercial herring fishing occurring in all but the Barren Islands District (Figure 1). Herring fishing began in the Southern District in 1914 as a gillnet fishery within Kachemak Bay. Eight saltries, six near Halibut Cove, were operating during the peak of the fishery. Fishing with purse seines began in 1923, and after three subsequent years of average annual harvests approaching 8,000 short tons (st), herring populations, and the fishery, collapsed.

The next LCI herring fishery began in 1939 and was centered in the Resurrection Bay and Day Harbor area of the Eastern District. This was a purse seine fishery with the product used exclusively for oil and meal reduction. Peak harvests occurred from 1944 through 1946, averaging 16,000 st each year, and stocks sharply declined thereafter, apparently due to over-exploitation.

Japanese markets for a salted herring roe product resulted in development of a sac roe fishery in the 1960's. Market demand and the relatively high prices paid to fishermen caused rapid expansion of the fishing fleet and harvest. Although Department management and research efforts lagged behind the rapid growth of the fishery, conservative management strategies and guideline harvest levels were established in response to historical overexploitation of the herring fisheries statewide.

1992 SEASON SUMMARY

A total of 2,282 st of Pacific herring was landed in the Kamishak Bay District during 1992 (Tables 10 and 11). The herring sac roe

harvest was about 19% higher than the 1991 harvest of 1,922 st but only about one-third the record high catch of 6,132 st set in 1987 (Appendix Table 31). Estimated exvessel value of the 1992 harvest was \$1.4 million (Appendix Table 32).

Of the 78 LCI herring permits issued, only 56 permit holders made deliveries in 1992. A total of 11 processors/buyers purchased herring this season and roe recoveries averaged 9.7% for the sac roe harvest (Appendix Table 32).

The total herring spawning biomass in the Kamishak Bay District, estimated from aerial surveys and postseason age composition analysis, was 24,077 st, nearly 50% greater than the preseason forecast of 16,431 st. Age composition from the commercial catch differed significantly from the preseason projection, with recruitment of young (age-4 and age-5) fish over three times greater than forecasted.

No sac roe herring fishery occurred in the Southern District in 1992 as fish were never present in sufficient numbers to allow a harvest. The Outer and Eastern Districts were opened to purse seining for a six-hour period each day for approximately three weeks but few herring were observed by the one participating boat and spotter combination and no harvest occurred. The lack of interest by processors and fishermen in these areas was due to past years' predominance of young (age-3 and age-4) fish, roe recoveries historically below 10%, and the exploratory nature of the fishery.

ASSESSMENT METHODS

Aerial surveys were conducted throughout the herring spawning season to determine relative abundance and distribution of herring in the Kamishak Bay and Southern Districts. Data collection methods were consistent with those used the previous two seasons.

Numbers and distribution of herring schools, location and extent of milt, and visibility factors affecting survey results were recorded on index maps for each survey. Standard conversion factors of 1.52 st (water depths of 16 ft or less), 2.56 st (water depths between 16 and 26 ft), and 2.83 st (water depths greater than 26 ft) per 538 square feet were used to convert estimated herring school surface areas to biomass.

Survey conditions in the Kamishak Bay District were generally excellent throughout the early part of the season, with relatively few days hampered by low cloud ceilings, fog, or high winds. However, poor weather after the fishery in May limited surveys of the district for 18 consecutive days. Only 18 surveys were completed in the Kamishak Bay District, and 14 in the Southern District. No comprehensive surveys of the Outer and Eastern Districts were conducted this season.

In the Kamishak District, commercial landings were sampled to determine age, size, and sexual maturity of herring. In addition, test fishing by volunteer purse seine vessels was conducted to collect samples for roe recovery analysis prior to the fishery. Test fishing data was also used in postseason analysis to interpret aerial survey biomass data.

SPAWNING POPULATIONS

Kamishak Bay District

During the 1992 season aerial surveys to estimate biomass in the Kamishak Bay District were conducted from April 17 through June 10, with herring first observed April 22. Daily biomass estimates did not exhibit the normal trends in abundance i.e., build-up, peak, and decline. The highest daily biomass observations were made on April 30 (7,179 st), and May 1 (3,746 st). Unlike previous years,

there was no distinct separation in age composition between those fish appearing on the grounds early and those showing later. Normally, the early fish tend to be larger and older, whereas an influx of younger age fish typically occurs later in the return. However, initial test fish samples as well as commercial catch samples in 1992 documented an unusually high percentage of age-4 fish this season.

Postseason data analysis from aerial surveys, test fishing, and commercial harvests resulted in a total spawning biomass estimate of 24,077 st (Table 11, Appendix Table 32). This was considered a minimal estimate since an additional (undocumented) quantity of herring was known to be present during the first two weeks of May when aerial surveys were precluded by poor weather. Only 12.4% of the total biomass (by weight) was composed of ages 9-14 herring. Ages 7-8 accounted for 21.4%, ages 5-6 herring 19.3%, while newly recruited ages 3 and 4 herring represented 47% of the total spawning population (Figure 15, Table 11).

Limited spawning was observed from April 29 through May 21 throughout the district. Most observations of spawning were recorded between April 29 and May 1, but nearly all sightings were relatively few and small in size. The heaviest spawning was observed inside Bruin Bay on May 1 when an estimated 3.2 linear miles were recorded.

Southern District

A total of 14 aerial surveys of the Southern District were flown between April 27 and June 5, resulting in a final biomass estimate of 3,330 st. The majority of the herring were observed in Mud Bay, Bear Cove, and Mallard Bay, with the peak individual biomass survey (1,378 st) occurring on June 5. Peak surveys in areas where herring have historically been observed were as follows: Bear Cove, 333 st on June 5; Mallard Bay, 628 st on May 18; and 740 st

east of the Homer Spit on June 5. No age composition or roe recovery samples were collected from the Southern District in 1992.

Outer and Eastern Districts

Only one partial aerial survey of the Outer and Eastern Districts was flown during the 1992 season. The size of the area and the characteristically poor weather in the Gulf of Alaska, which precludes surveys on a regular basis, makes aerial biomass estimation in these two districts impractical. However, incidental observations of herring in June during the early part of the salmon season confirmed the presence of herring in these two districts again this season.

COMMERCIAL FISHERY

Kamishak Bay District

Spotter pilots and fishermen first located and fished the Kamishak Bay District herring populations in 1973, but after several years of commercial harvests in the late 1970's herring abundance declined severely and the district was closed completely beginning in 1980. Herring stocks appeared to rebound quickly in response to the closure, and the fishery was reopened in 1985. Since then, the fishery has been regulated to achieve a 10% to 20% exploitation rate mandated by the Alaska Board of Fisheries.

By 1989, fishing efficiency had evolved to a level where intensive regulatory management was required to ensure maximum value of the harvest and maintain the guideline harvest level while protecting younger age fish. Management strategy during the last three years in the Kamishak Bay District had stabilized the harvest at approximately one-third the record high catch of 6,132 st set in 1987 (Table 3).

Preseason management strategy in 1992 called for a guideline harvest level of 1,479 st based on a 10% exploitation of the previous year's final biomass estimate. The conservative harvest rate was selected because of concern regarding the low abundance of recruit age herring during 1990 and 1991. Although management prior to 1990 allowed this fishery to be open on a specific calendar date, since that time industry technicians have been asked to evaluate test fish samples for roe recovery prior to commercial harvests to help maximize product quality and value.

Calm sunny weather, uncharacteristic for Kamishak Bay, was present on the grounds when the management staff arrived on board the state R/V *PANDALUS* on Monday, April 20. A volunteer test fish program utilizing commercial purse seine vessels was initiated the next day, with the first samples of the season caught that same day between Chenik Head and Nordyke Island. Age analysis on these first fish, completed on April 22, showed a much higher incidence (37%) of age-4 fish than the preseason forecast. It was unusual for recruit age herring to be present on the grounds so early in the season since historical data indicated that age-3 and age-4 fish do not typically arrive on the grounds in significant quantities until the second week in May. Roe recovery estimates conducted by industry technicians yielded results of 11.9% and 10.3% mature roe in two separate samples of the first day's test fish taken in the Chenik Head and Nordyke Island areas. In order to allow the staff to react to any rapid developments, it was announced on April 21 that the advance notice period would be reduced to two hours effective Thursday, April 23, at 6:30 p.m.

Excellent weather prevailed and herring were first spotted from the air on April 22. Department surveys continued on April 23, locating approximately 275 tons of fish in the Bruin Bay/Contact Point vicinity and approximately 130 tons in the Chenik Head/Nordyke Island area. All of these observations were assumed to be minimal estimates since many vessels were locating fish with

hydroacoustic gear. Samples from fish collected in four different locations on April 22-23 showed roe maturities ranging from 9.6% to 11.4% with average weights ranging from 256 g to 120 g. The proportion of immature roe dropped from 3.9% on April 22 to 1.5% on April 23, while the age-4 component increased from 37% on April 21 to 44% on April 23.

Although the samples suggested that the opportunity to target the harvest on older age classes was slipping away and that spawning was imminent, the fleet was advised that an opening was not being considered for April 23. At the time, tender capacity was considered insufficient for the guideline harvest level since many of the companies still had not yet registered and very few tenders were present on the grounds. The staff felt that more comprehensive sampling and further evaluation was also desirable.

Although the tranquil weather continued into Friday, April 24, the marine weather forecast projected a significant deterioration in local weather conditions later that evening and persisting for several days. Because the forecasted poor weather (40 k gale force winds) could have precluded the opportunity to conduct a fishery for some time, the staff concluded that further delay of the fishery would likely result in reduced roe recoveries due to the influx of younger (immature) fish and/or an increase in the number of spawn-outs. Since the management strategy attempts to minimize the harvest of younger age fish, and given the favorable weather conditions at the time, a 30-minute fishing period was announced for Management Areas 5 and 6 (Figure 7), commencing by field announcement sometime between 4:55 p.m. and 5:05 p.m., April 24. Because the observed biomass was relatively small, it was deemed unnecessary to restrict the fleet to a limited area. The large open area allowed the fleet and their spotter aircraft ample space to work efficiently.

Despite the staff's best efforts at using a field announcement in conjunction with time checks on single sideband and VHF radio frequencies to alleviate the possibility of early sets, spotter pilots observed and reported three vessels setting gear near Contact Point prior to the announced opening. As a result the fishery was delayed 20 minutes until Fish and Wildlife Protection officers arrived on the scene to force compliance. The actual opening was announced at 5:20 p.m. and lasted until 5:50 p.m.

Approximately 30 commercial spotter aircraft were present during the opening. Weather and water conditions allowed easy observation of herring from the air, and much of the seining was done with the aid of spotter airplanes. The bulk of the harvest occurred between Chenik Reef and Fortification Bluff with the total catch amounting to 2,282 st taken by 56 permit holders (Table 10) during the 30-minute opening. This was 800 st more than the preseason guideline but approximately 1,100 st less than the 1985-91 average catch for Kamishak Bay District. Once the staff determined that the guideline harvest level had been achieved, it was announced late on the evening of April 24 that no further openings in the Kamishak Bay District would be allowed in 1992.

In retrospect, allowing an opening a day earlier on April 23 may have achieved slightly higher roe quality, when the mean weight of the fish was significantly greater. The overall quality of the sac roe harvest suffered because of the large influx of young recruit-age herring into the population. This situation was unusual for the Kamishak Bay fishery where older (generally ripe) fish have historically dominated the early segment of the run. Age composition and roe maturity were opposing factors in the staff's attempt to determine the optimum time for the opening. Test fishing sample results between April 21 and April 24, prior to the fishery, clearly indicated a decreasing trend in mean weight and an increasing abundance of younger age fish, as shown in the following table:

Date	Mean Weight	Percent Age-4	Mature Roe %	Immature Roe %	% Ripe Females
4/21	192	37.1	6.8		40.9
4/22	182	39.0	9.6	3.9	48.0
4/23	180	43.8	10.6	1.5	41.3
4/24	152	61.4	10.3	0.5	40.6

Unfortunately, when the mean weight of the fish was highest and the older age classes dominated the population, the mature roe percentage was the lowest.

The limited on-grounds tender capacity was another factor compromising the timing of the Kamishak Bay fishery opening. Because most buyers were still finishing operations in the Prince William Sound herring fishery, the arrival of most tenders in Kamishak Bay was delayed until the evening of April 23. Although the majority of the actual fishing fleet was present, tenders were still arriving throughout the day of the fishery and several companies still had not yet registered with the Department.

Preliminary value of the Kamishak Bay District herring harvest to fishermen was estimated at \$1.4 million (Appendix Table 32). Sac roe prices were estimated at \$600 per short ton for 10% roe, plus or minus \$100 for each 1.0% change. The estimated average roe recovery of 9.7% for the sac roe harvest yielded an exvessel price of \$570 per short ton without accounting for any postseason adjustments. Most companies paid an "on-grounds" base price with additional postseason settlements to be paid after price finalization with the foreign market.

By Board of Fisheries directive, the Kamishak Bay District herring fishery is managed with the intent of harvesting 10% to 20% of the available biomass. The overall exploitation was 9.5% of the 1992

estimated spawning biomass, based on a total harvest of 2,282 st and a total biomass estimate of 24,077 st.

Southern District

Management strategy for the Southern District sac roe fishery was changed in 1989 to allow for a limited harvest of 150 to 200 st for the purposes of obtaining age, weight, length and roe recovery information. Sac roe herring had not been fished in the Southern District since 1979 when poor stock conditions forced an area-wide closure. Only one other fishery has occurred since that time, when 171 st of herring averaging 8.9% roe recovery were harvested by 10 vessels in one 2.5-hour opening in Mallard Bay during 1989.

After the completion of the Kamishak Bay herring fishery, management attention was directed toward the Southern District on April 27 when the first aerial survey was flown. Surveys continued into early June, but a commercial harvest of sac roe herring was not allowed in the Southern District in 1992 because abundance estimates failed to document sufficient quantities of herring to warrant an opening.

Outer and Eastern Districts

During the early years of sac roe herring fishing in LCI, seining within the Outer and Eastern Districts primarily occurred in Resurrection Bay. Following a period of suspected over-exploitation, herring stocks throughout LCI generally declined after 1973. Concern over this decline prompted the Board of Fish and Game in 1974 to establish a 4,000-ton quota for all of Lower Cook Inlet, with the Outer and Eastern Districts each allocated 1,000 st. The quotas were never utilized since stock abundance continued to decline, and the Outer and Eastern Districts were closed to fishing from 1975 through 1984.

In 1985, the sac roe fishery was allowed to resume in the Outer and Eastern Districts on a very conservative basis, even though no noticeable change in spawning biomass had been observed. Because of reduced stock abundance and extreme vulnerability to fishing, guideline harvest levels were set at 150 to 200 st for each of the four fishing areas created within these two districts. Fishing effort in 1985 was minimal and the majority of the harvest (216 st; Appendix Table 31) once again occurred in Resurrection Bay.

Only limited and sporadic harvests have occurred in these two districts since 1985, with the majority of both the herring harvest and the observed biomass during the past six years comprised of age-3 and age-4 fish. Unlike the Southern and Kamishak Bay Districts, samples from the Outer and Eastern Districts have contained up to 14% age-2 (sexually immature) herring. Although sampling has been limited, no discernable shift to older age herring has ever been observed, suggesting the possibility that the Outer and Eastern Districts may be feeding and rearing grounds for juvenile fish of Prince William Sound origin.

In 1991 the two districts were opened to purse seining for a six-hour period each day for three weeks, with the resulting effort amounting to four boats, one spotter aircraft, and no harvest. In 1992 the areas were again opened to fishing on a similar schedule, but only one boat and spotter expressed interest and put forth a very limited effort. Despite significant opportunity for exploratory fishing on a daily basis in the Outer and Eastern Districts for the past two seasons, the predominance of juvenile herring in the population, and the history of marginally acceptable roe recoveries from fish caught in these areas, has contributed to a lack of interest by fishermen and processors.

HERRING OUTLOOK AND MANAGEMENT STRATEGY FOR 1993

Kamishak Bay District

The 1993 spawning biomass of herring in Kamishak Bay District is projected to be 28,805 st, approximately 20% greater than the 1992 biomass (Figure 14, Table 11). The 1993 forecast is based on age specific estimates of (1) the 1992 commercial harvest and escapement biomass, (2) historical mortality and recruitment trends, and (3) 1992 mean weights. Only one-fifth of the biomass is expected to be 7 years or older. The 1987 and 1988 year classes are projected to represent nearly 79% of the biomass by weight (Table 11). Given the forecasted age composition, the average weight of the fish would equal approximately 172 grams.

In addition to the spring sac roe fishery in LCI, a fall food and bait fishery on Kamishak Bay herring stocks occurs in the Shelikof Straits area of the Kodiak management area. This fishery has an allocation of 1% to 2% of the total Kamishak Bay herring biomass forecast. The actual guideline harvest level and exploitation rate for the fall Shelikof fishery is determined by the Kamishak Bay biomass forecast for the following spring and the expected age composition of that forecast.

Limited data indicates an increase in the 1993 herring abundance due to a significant recruitment of young (age-4) fish into the population in 1992. Although stocks appear to be building, solid verification of this trend is warranted before harvest rates will be increased. In keeping with the newly adopted management plan, a 10% exploitation rate was used to set the guideline harvest level for the 1993 season since two-thirds of the biomass is still expected to be age 5 and younger. Based on the projected 1993 biomass estimate of 28,805 st, a surplus of approximately 2,880 st would be available for harvest. Harvest allocation in accordance with the management plan would be as follows:

		<u>Tons</u>
TOTAL ALLOWABLE HARVEST	(10%)	2,880
SHELIKOF STRAITS FOOD & BAIT	(1%)	288
KAMISHAK BAY SAC ROE HARVEST	(9%)	2,592

The model used to prepare the 1993 forecast has a performance history of underestimating the actual biomass 62.5% of the time, or nearly two out of every three forecasts. Given the performance history of the forecast and the limited data base, the preseason projections should be used with caution.

Other Districts

Based on recent trends in herring abundance in the Southern, Outer, and Eastern Districts of LCI, no commercial herring harvests are anticipated in these areas. However, openings may once again be allowed in the Outer and Eastern Districts on an "exploratory" basis, while sufficient quantities of herring in the Southern District must be documented before a commercial opening is considered. Monitoring of the Southern District herring stocks will occur as in the past through the use of aerial surveys in conjunction with possible test fishing samples. Assessment of the Outer and Eastern Districts will include aerial surveying only if initial information gathered from any exploratory commercial effort justifies such monitoring.

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Table 1. Commercial, hatchery, and derby salmon catches in numbers of fish by species and district, Lower Cook Inlet, 1992.

DISTRICT	Chinook	Sockeye	Coho	Pink	Chum	Total
SOUTHERN						
Commercial:						
Set Net	1,288	17,002	848	15,958	1,687	36,783
P. Seine	564	82,455	429	125,106	193	208,747
Hatchery						
P. Seine	<u>0</u>	<u>7,336</u>	<u>0</u>	<u>275,957</u>	<u>5</u>	<u>283,298</u>
TOTAL	1,852	106,793	1,277	417,021	1,885	528,828
OUTER						
Commercial:						
P. Seine	0	572	1	146	181	900
EASTERN						
Commercial:						
P. Seine	0	432	1,131	60,007	86	61,656
Derby:						
Hand Troll	0	0	477	0	0	477
Hatchery:						
Weir	<u>0</u>	<u>0</u>	<u>1,528</u>	<u>0</u>	<u>0</u>	<u>1,528</u>
TOTAL	0	432	3,136	60,007	86	63,661
KAMISHAK						
Commercial:						
P. Seine	39	60,078	1,488	2,594	20,051	84,250
Hatchery:						
P. Seine	<u>0</u>	<u>8,769</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>8,769</u>
TOTAL	39	68,847	1,488	2,594	20,051	93,019
LCI TOTAL	1,891	176,644	5,902	479,768	22,203	686,408
PERCENT	0.3	25.7	0.9	69.9	3.2	100.0
1972 - 91 AVERAGE	898	152,866	11,655	942,130	112,395	1,219,944

Table 2. Commercial chinook salmon catches and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1992.

Subdistrict/System	Catch	Escapement ^a	Total Run
SOUTHERN DISTRICT			
Halibut Cove	949		949
Halibut Cove Lagoon	85		85
China Poot Bay	195		195
Neptune Bay	20		20
Tutka Bay	187		187
Barabara Creek	115		115
Seldovia Bay	<u>301</u>		<u>301</u>
SOUTHERN DISTRICT TOTAL	1,852		1,852
OUTER DISTRICT TOTAL	0		0
EASTERN DISTRICT TOTAL	0		0
KAMISHAK DISTRICT			
Iniskin Bay	1		1
Kirschner Lake	2		2
Chenik Lake	1		1
McNeil River	4		4
Douglas River	<u>31</u>		<u>31</u>
KAMISHAK DISTRICT TOTAL	39		39
TOTAL LOWER COOK INLET	1,891		1,891

^a Chinook escapement in Lower Cook Inlet is very limited; no escapement surveys are conducted.

Table 3. Commercial sockeye salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1992.

Subdistrict/System	Catch	Escapement ^a	Total Run
SOUTHERN DISTRICT			
Humpy Creek	0	9	9
Halibut Cove	12,187		12,187
Halibut Cove Lagoon	2,492		2,492
China Poot Bay			
Common Property Fishery	56,312		
Hatchery Cost Recovery	7,336		
Total Run			63,648
Neptune Bay	12,331		12,331
Tutka/Kasitsna Bays	8,578	1	8,579
Seldovia Bay	3,285	8	3,293
Barabara Creek	4,272	2	4,274
English Bay	<u>0</u>	<u>6,354</u>	<u>6,354</u>
SOUTHERN DISTRICT TOTAL	106,793	6,374	113,167
OUTER DISTRICT			
Port Chatham	0	3	3
Windy River Left	0	1	1
Port Dick			
South Section	422		
Entrance	150		
Head End Creek		5	
Total Run			577
East Nuka (McCarty Fiord)			
Desire Lake	0	11,900	
Delight Lake	0	5,850	
Delectable (Ecstasy) Lake	0	1,000	
Total Run	<u>0</u>	<u>18,750</u>	<u>18,750</u>
OUTER DISTRICT TOTAL	572	18,759	19,331

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Table 3. (page 2 of 2)

Subdistrict/System	Catch	Escapement ^a	Total Run
EASTERN DISTRICT			
Resurrection Bay	0		
Bear Lake		1,921	
Total Run			1,921
Aialik Bay	432		
Aialik Lake		2,500	
Total Run			<u>2,932</u>
EASTERN DISTRICT TOTAL	432	4,421	4,853
KAMISHAK DISTRICT			
Ursus Cove	13		13
Rocky Cove	15		15
Kirschner Lake	40,043		40,043
Bruin Bay	503	40	543
Chenik Lake			
Common Property Fishery	5,609		
Hatchery Cost Recovery	8,769		
Amakdedori Creek		1,900	
Chenik Creek		9,269 ^b	
Total Run			25,547
Paint River	0	300 ^c	300
McNeil Cove	3,963		
Mikfik Creek		7,770	
Total Run			11,733
Kamishak/Douglas Reef	289		
Little Kamishak River		230	
Strike Creek		30	
Big Kamishak River		4,600	
Total Run			5,149
Douglas River/Silver Beach	9,643		
Douglas Clearwater Trib.		200	
Total Run			<u>9,843</u>
KAMISHAK DISTRICT TOTAL	68,847	24,339	93,186
TOTAL LOWER COOK INLET	176,644	53,893	230,537

^a Escapement estimates derived from limited aerial surveys. Numbers represent unexpanded aerial live counts.

^b Weir counts.

^c No freshwater escapement, fish ladder not opened during 1992.

Table 4. Commercial coho salmon catches (including hatchery cost recovery and sport fish derby) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1992.

Subdistrict/System	Catch	Escapement ^a	Total Run
SOUTHERN DISTRICT			
Northshore	0		
Clearwater Slough		850	
Total Run			850
Halibut Cove	94		94
Halibut Cove Lagoon	19		19
China Poot Bay	212		212
Neptune Bay	98		98
Tutka Bay	391		391
Seldovia Bay	58		58
Barabara Creek	<u>405</u>		<u>405</u>
SOUTHERN DISTRICT TOTAL	1,277	850	2,177
OUTER DISTRICT			
Port Dick (South Section)	<u>1</u>		<u>1</u>
OUTER DISTRICT TOTAL	1		1
EASTERN DISTRICT			
Aialik Bay	1,131		1,131
Resurrection Bay			
Seward Silver Salmon Derby	477		
Bear Lake (hatchery)	1,528		
Total Run	<u></u>		<u>2,005</u>
EASTERN DISTRICT TOTAL	3,136		3,136
KAMISHAK DISTRICT			
Kirschner Lake	1		1
Douglas River	<u>1,487</u>		<u>1,487</u>
KAMISHAK DISTRICT TOTAL	1,488		1,488
TOTAL LOWER COOK INLET	5,902	850	6,752

^a Escapement estimates derived from limited aerial surveys. Numbers represent unexpanded aerial live counts.

Table 5. Commercial pink salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1992.

Subdistrict/System	Catch	Escapement ^a	Total Run
SOUTHERN DISTRICT			
Humpy Creek	0	14,853	14,853
Halibut Cove	20,736		20,736
Halibut Cove Lagoon	37,697		37,697
China Poot Bay	26,040	4,116	30,156
Neptune Bay	9,649		9,649
Tutka/Kasitsna Bays			
Common Property Fishery	41,642		
Hatchery Cost Recovery	275,957 ^b		
Hatchery Broodstock		67,324	
Sadie Cove Creek		455	
Tutka Head End Creek		^c	
Tutka Lagoon Creek		26,653	
Jakolof Bay Creek		30	
Total Run			412,061
Barabara Creek	3,386	2,186	5,572
Seldovia Bay & River	1,914	14,682	16,596
Port Graham River	0	5,450	5,450
English Bay	<u>0</u>	<u>^c</u>	<u>0</u>
SOUTHERN DISTRICT TOTAL	417,021	135,749	552,770
OUTER DISTRICT			
Dogfish Bay	0	^c	0
Port Chatham	0	4,304	4,304
Chugach Bay	0	671	671
Windy Bay	0		
Windy River Left		8,203	
Windy River Right		3,856	
Total Run			12,059
Rocky Bay			
Scurvy Creek	0	629	
Rocky River	0	25,448	
Total Run			26,077

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Table 5. (page 2 of 3)

Subdistrict/System	Catch	Escapement ^a	Total Run
Port Dick			
South Section	65		
Entrance	81		
Port Dick-Head End Creek		6,881	
Port Dick-Slide Creek		3,890	
Port Dick-Middle Creek			
Port Dick-Island Creek		10,143	
Additional saltwater fish		2,500	
Total Run			23,560
Taylor Bay	0	257	257
Nuka Island (South)	0	6,105	6,105
East Nuka (McCarty Fiord)	0		
James Lagoon		428	
Desire Lake		351	
Delight Lake		293	
Total Run			1,072
OUTER DISTRICT TOTAL	146	73,959	74,105
EASTERN DISTRICT			
Aialik Bay	60,007		60,007
Resurrection Bay	0		
Bear Creek		2,345	
Salmon Creek		5,255	
Tonsina Creek			
Thumb Cove		386	
Total Run			7,986
EASTERN DISTRICT TOTAL	60,007	7,986	67,993
KAMISHAK DISTRICT			
Iniskin Bay	8		
Sugarloaf Creek		25	
Total Run			33
Cottonwood Bay	0	106	106
Ursus Cove	4		
Ursus Head Creek		116	
Brown's Peak Creek		5,025	
Ursus Lagoon Righthand		150	
Ursus Lagoon Creek		375	
Total Run			5,670

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Table 5. (page 3 of 3)

Subdistrict/System	Catch	Escapement ^a	Total Run
Rocky Cove	307		
Sunday Creek		2,930	
Total Run			3,237
Kirschner Lake	1,759		1,759
Bruin Bay	92	3,200	3,292
Chenik Lake	62		
Amakdedori Creek		3,200	
Total Run			3,262
Kamishak Rivers/Douglas Reef	20		20
Douglas River/Silver Beach	<u>342</u>	<u> </u>	<u>342</u>
KAMISHAK DISTRICT TOTAL	2,594	15,127	17,721
<hr/>			
TOTAL LOWER COOK INLET	479,768	232,821	712,589

^a Escapement estimates in the Southern, Outer, and Eastern Districts derived from periodic ground surveys with stream life factors applied. Kamishak estimates are unexpanded peak aerial live counts.

^b Tutka hatchery cost recovery total includes 60 pinks actually caught in China Poot Subdistrict.

^c Insufficient survey data for escapement estimates.

Table 6. Commercial chum salmon catches and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1992.

Subdistrict/System	Catch	Escapement ^a	Total Run
SOUTHERN DISTRICT			
Humpy Creek	0	147	147
Halibut Cove	85		85
Halibut Cove Lagoon	4		4
China Poot Bay	69		69
Neptune Bay	34		34
Tutka/Kasitsna Bays	550 ^b		
Sadie Cove		c	
Tutka Head End Creek		c	
Tutka Lagoon Creek		63	
Jakolof Bay		98	
Total Run			711
Seldovia Bay	701		
Seldovia River		868	
Total Run			1,569
Barabara Creek	442		442
Port Graham River	<u>0</u>	<u>1,356</u>	<u>1,356</u>
SOUTHERN DISTRICT TOTAL	1,885	2,532	4,417
OUTER DISTRICT			
Dogfish Bay	0	799	799
Port Chatham	0	343	343
Windy Bay	0		
Windy River Left		56	
Windy River Right		272	
Total Run			328
Rocky River	0	1,680	1,680
Port Dick			
South Section	136		
Entrance	45		
Port Dick-Head End Creek		5,405	
Port Dick-Slide Creek		1,204	
Port Dick-Middle Creek		320	
Port Dick-Island Creek		6,662	
Total Run			13,772
Petrof River	0	5	5
East Nuka-James Lagoon	<u>0</u>	<u>575</u>	<u>575</u>
OUTER DISTRICT TOTAL	181	17,316	17,497

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Table 6. (page 2 of 3)

Subdistrict/System	Catch	Escapement ^a	Total Run
EASTERN DISTRICT			
Aialik Bay	86		86
Resurrection Bay	0		
Tonsina Creek		193	
Total Run			193
EASTERN DISTRICT TOTAL	86	193	279
KAMISHAK DISTRICT			
Iniskin Bay	208		
Iniskin River		3,354	
Sugarloaf Creek		1,791	
Total Run			5,353
Cottonwood Creek	0	6,085	6,085
Ursus Cove	1,562		
Ursus Lagoon Creek		1,380	
Ursus Head Creek		129	
Brown's Peak Creek		300	
Ursus Lagoon Righthand Cr.		694	
Total Run			4,065
Rocky Cove	1,168		
Sunday Creek		2,239	
Total Run			3,407
Kirschner Lake	472		472
Bruin Bay	312	8,500	8,812
Chenik Lake	220		220
McNeil River	2,041	19,206	21,247
Kamishak River/Douglas Reef	1,526		
Little Kamishak River		7,065	
Strike Creek		500	
Big Kamishak River		4,500	
Douglas (Reef) River		350	
Total Run			13,941

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Table 6. (page 3 of 3)

Subdistrict/System	Catch	Escapement ^a	Total Run
Douglas River/Silver Beach	12,542		
Douglas Beach Creek		100	
Total Run			<u>12,642</u>
KAMISHAK DISTRICT TOTAL	20,051	56,193	76,244
TOTAL LOWER COOK INLET	22,203	76,234	97,251

^a Escapement estimates in the Southern, Outer, and Eastern Districts derived from periodic ground surveys with stream life factors applied. Kamishak estimates are unexpanded peak aerial live counts.

^b Includes 5 fish taken incidentally during hatchery cost recovery.

^c Insufficient survey data for escapement estimates.

Table 7. Exvessel value^a of the commercial salmon catch in number of dollars, by species and gear type, Lower Cook Inlet, 1992.

	Chinook	Sockeye	Coho	Pink	Chum	Total
PURSE SEINE						
No. Fish	603	159,642 ^b	3,049	463,810 ^b	20,516	647,620
Pounds	5,932	693,163 ^b	24,271	1,451,586 ^b	185,094	2,360,046
Price/ Pound	0.97	1.47	0.43	0.14	0.26	
Value	5,754	1,018,950	10,437	203,222	48,124	1,286,487
SET GILLNET						
No. Fish	1,288	17,002	848	15,958	1,687	31,909
Pounds	17,341	90,609	5,782	63,990	10,836	176,539
Price/ Pound	1.41	1.46	0.50	0.15	0.33	
Value	24,451	132,289	2,891	9,599	3,576	172,806
TOTAL ALL GEAR						
No. Fish	1,891	176,644	5,902 ^c	479,768	22,203	686,408
Pounds	23,273	783,772	45,305 ^c	1,515,576	195,930	2,563,456
Value	30,205	1,151,239	19,624 ^c	212,821	51,700	1,465,589

^a Exvessel value is calculated from average prices, which are determined only by fish ticket information and do not reflect any retroactive or postseason price adjustments.

^b Includes fish taken for hatchery cost recovery.

^c In addition to set gillnet and purse seine catches, 477 cohos taken during Seward Silver Salmon Derby, and 1,528 silvers taken for private hatchery cost recovery.

Table 8. Emergency orders issued for commercial and subsistence salmon and herring fisheries in Lower Cook Inlet, 1992.

Number/ Issue Date	Description
2-F-H-001-92 April 24	Opens Management Areas 5 and 6 in the Kamishak Bay District to commercial herring sac roe seining for approximately one-half hour commencing by an ADF&G field announcement sometime between 5:15 and 5:25 p.m. Friday, April 24, 1992. The fishery will close at 5:50 p.m. Management Areas 5 and 6 include those waters south of 59°23.13' N. latitude and west of 153°37.0' W. longitude.
2-F-H-002-92 April 27	Opens the Outer and Eastern Districts to commercial herring sac roe seining for a six-hour period each day, from 10:00 a.m. until 4:00 p.m., effective Tuesday, April 28, 1992, until further notice.
2-F-H-003-92 May 8	Opens those waters of Resurrection Bay in the Eastern District enclosed by a line from Aialik Cape south to a point one mile due south of Aialik Cape, then northeast to a point one mile due south of Cape Resurrection, then north to Cape Resurrection, to commercial salmon seining on a schedule of two forty-hour weekly fishing periods, from Monday 6:00 a.m. until Tuesday 10:00 p.m. and from Thursday 6:00 a.m. until Friday 10:00 p.m., effective Monday, May 11, 1992, until further notice.
2-F-H-004-92 May 26	Closes the Outer and Eastern Districts of Lower Cook Inlet to herring sac roe seining effective at 4:00 p.m. Friday, May 29, 1992.
2-F-H-005-92 May 26	Closes the Port Graham and English Bay areas to commercial set gillnet fishing prior to the regulatory opening date of June 1, 1992, until further notice.
2-F-H-006-92 May 26	Closes the Port Graham and Koyuktolik (Dogfish) Sub-districts to subsistence gillnet fishing effective 6:00 a.m. Monday, June 1, 1992, until further notice.

-continued-

Table 8. (page 2 of 8)

Number/ Issue Date	Description
2-F-H-007-92 May 29	Extends the southern boundary of the area open to commercial set gillnetting in Seldovia Bay from the current location listed in the regulation book at 59°25'30" N. latitude, south approximately 2,000 feet to an unnamed creek at 59°25'11" N. latitude.
2-F-H-008-92 June 5	Reopens the Koyuktolik (Dogfish) Subdistrict to subsistence gillnet fishing effective 6:00 a.m. Monday, June 8, 1992, until further notice.
2-F-H-09-92 June 12	Designates and establishes Special Harvest Areas for the Cook Inlet Aquaculture Association (CIAA) in the Chenik, Paint River, and China Poot Subdistricts of the Lower Cook Inlet management area. During periods established by emergency order, CIAA may harvest a portion of the sockeye salmon returning to these three areas for recovery of operational costs expended towards sockeye salmon enhancement programs in Lower Cook Inlet.
2-F-H-10-92 June 11	Closes the Chenik Lake Special Harvest Area and the Paint River Subdistrict to the common property salmon seine fishery and opens waters of the Chenik Lake and Paint River Special Harvest Areas to the harvest of salmon seven days per week by authorized agents of Cook Inlet Aquaculture Association (CIAA) effective at 6:00 a.m. Monday, June 15, 1992, until further notice. The Chenik Lake Special Harvest Area consists of all marine waters of the Chenik Subdistrict north of 59°12'30" N. latitude, south of 59°14'30" N. latitude, and west of 154°00'00" W. longitude. The Paint River Special Harvest Area consists of all marine waters of Akjemguiga Cove west of a line drawn from a point on the south shore at approximately 59°09'30" N. latitude, 154°12'50" W. longitude to a point on the north shore at approximately 59°10'00" N. latitude, 154°12'30" W. longitude. Regulatory markers in Chenik Lagoon have been covered and seining will be allowed up to the stream mouth.

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Table 8. (page 3 of 8)

Number/ Issue Date	Description
2-F-H-11-92 June 19	<p>Designates and establishes a temporary Special Harvest Area for the Cook Inlet Aquaculture Association (CIAA) in the Tutka Bay Subdistrict within the Southern District of Lower Cook Inlet. The Tutka Bay Special Harvest Area (SHA) consists of all marine waters of the Tutka Bay Subdistrict southeast of the Homer Electric Association powerline crossing, including Tutka Bay Lagoon.</p> <p>In addition, this emergency order opens the Tutka Bay Special Harvest Area to the capture and sale of salmon by authorized agents of CIAA effective at 6:00 a.m. Thursday, June 25, 1992, until further notice. Revenue obtained from the sale of these fish will be used for recovery of operational costs associated with the Tutka Lagoon Hatchery salmon enhancement programs in Lower Cook Inlet.</p> <p>The commercial purse seine fishery in the Tutka Bay Subdistrict will be restricted to those waters outside of Tutka Bay proper. Waters of Tutka Bay inside of a line extending from the "rock quarry" on the north side of the bay at approximately 59°30'14" N. latitude, 151°28'14" W. longitude, to the Tutka Bay Lodge on the south side of the bay at approximately 59°28'31" N. latitude, 151°28'55" W. longitude, will be closed after 6:00 a.m. Thursday, June 25, until further notice (see LCI E.O. No. 2-F-H-12-92).</p>
2-F-H-12-92 June 19	<p>Opens waters of the China Poot Subdistrict and portions of the Tutka Bay and Halibut Cove Subdistricts, all within the Southern District, to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective 6:00 a.m. Thursday, June 25, 1992, until further notice. The markers at the Homer Electric Association power line in China Poot Bay will not be in effect and fishing will be allowed up to the ADF&G regulatory markers at the mouth of China Poot</p>

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Table 8. (page 4 of 8)

Number/ Issue Date	Description
	<p>Creek. In the Halibut Cove Subdistrict, seining will only be allowed in waters outside of Halibut Cove Lagoon beginning June 25 on a five day per week basis. Seining inside Halibut Cove Lagoon will be allowed effective 6:00 a.m. Monday, July 6, on a five day per week basis. In the Tutka Bay Subdistrict, commercial seining is restricted to those waters seaward of a line extending from approximately 59°30'14" N. latitude, 151°28'14" W. longitude, to the Tutka Bay Lodge on the south side of the bay at approximately 59°28'31" N. latitude, 151°28'55" W. longitude, five days per week effective 6:00 a.m. Thursday, June 25, 1992.</p> <p>In addition, this emergency order opens the commercial set gillnet fishery in Halibut Cove Subdistrict five days per week effective 6:00 a.m. Monday, July 6, 1992, until further notice.</p> <p>In addition, this emergency order opens the China Poot Special Harvest Area to the harvest of salmon by authorized agents of Cook Inlet Aquaculture Association for two 12-hour periods, from 6:00 p.m. Sunday, June 28, until 6:00 a.m. Monday June 29, 1992 and from 6:00 p.m. Sunday, July 5 until 6:00 a.m. Monday, July 6, 1992.</p>
2-F-H-13-92 June 19	<p>Closes those waters of the north arm of China Poot Bay east of a line defined by ADF&G regulatory markers at approximately 59°33'33" N. latitude, 151°14'35" W. longitude and 59°33'50" N. latitude, 151°14'20" W. longitude, to commercial salmon seining effective at 6:00 a.m. Thursday, June 25, 1992, until further notice. The closed waters will provide a temporary sanctuary for juvenile Dungeness crab within the China Poot Subdistrict of the Southern District salmon management area.</p>

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Table 8. (page 5 of 8)

Number/ Issue Date	Description
2-F-H-14-92 June 26	Closes all waters of the McNeil River Subdistrict to commercial salmon fishing effective at 6:00 a.m. Monday, June 29, 1992, until further notice.
2-F-H-15-92 July 5	Opens waters of the South Section of the Port Dick Subdistrict between the ADF&G regulatory marker just west of the mouth of Port Dick Lake Creek and a marker on the west side of Shelter Cove at approximately 151°15' W. longitude, to commercial salmon fishing on a schedule of two 48-hour weekly fishing periods, from Monday 6:00 a.m. until Wednesday 6:00 a.m. and Thursday 6:00 a.m. until Saturday 6:00 a.m., effective Thursday, July 2, 1992, until further notice.
2-F-H-16-92 July 10	Opens the China Poot Special Harvest Area to the harvest of salmon by authorized agents of Cook Inlet Aquaculture Association for a 36-hour period, from 6:00 p.m. Saturday, July 11, until 6:00 a.m. Monday, July 13, 1992.
2-F-H-17-92 July 13	Opens waters of the Port Dick Subdistrict east of a line from a regulatory marker on the south shore of Port Dick near Phillipino Cove at approximately 151°06' W. longitude, 59°15'20" N. latitude, to a regulatory marker on the southwest shore of Taylor Bay at approximately 151°05' W. longitude, 59°16'12" N. latitude, to commercial salmon seine fishing on a schedule of two 40-hour weekly fishing periods, from Monday 6:00 a.m. until Tuesday 10:00 p.m. and from Thursday 6:00 a.m. until Friday 10:00 p.m., effective Monday, July 13, 1992, until further notice.
2-F-H-18-92 July 10	Closes all waters of the Resurrection Bay Subdistrict to commercial salmon fishing effective at 6:00 a.m. Monday, July 13, 1992, until further notice.

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Table 8. (page 6 of 8)

Number/ Issue Date	Description
2-F-H-19-92 July 2	Opens waters of the Aialik Subdistrict to commercial salmon fishing effective at 6:00 a.m. Monday, July 6, 1992, until further notice. Waters of Aialik Lagoon remain closed to fishing.
2-F-H-20-92 July 10	Amends and revises the weekly fishing schedule for commercial salmon fishing in those waters of the South Section of the Port Dick Subdistrict in the Outer District between an ADF&G regulatory marker just west of the mouth of Port Dick Lake Creek and a marker on the west side of Shelter Cove at approximately 151°15' W. longitude. Effective at 6:00 a.m. Monday, July 13, 1992, the above described waters will be open to commercial salmon fishing for two 40-hour periods per week, from Monday 6:00 a.m. until Tuesday 10:00 p.m. and from Thursday 6:00 a.m. until Friday 10:00 p.m., until further notice.
2-F-H-21-92 July 13	Closes commercial salmon seine fishing in those waters of China Poot Subdistrict of the Southern District east of a line connecting a point on the north shore of China Poot Bay at approximately 59°34'00" N. latitude, 151°17'30" W. longitude and a point on the south shore at approximately 59°33'30" N. latitude, 151°17'32" W. longitude (waters designated as the China Poot Bay Special Harvest Area), effective at 6:00 a.m. Wednesday, July 15, 1992, until further notice. Waters of the China Poot Subdistrict west (seaward) of this line remain open to commercial fishing five days per week. In addition, this emergency order allows authorized agents of Cook Inlet Aquaculture Association to harvest salmon in the China Poot Bay Special Harvest Area by purse seine seven days per week effective Wednesday, July 15, 1992, until further notice.

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Table 8. (page 7 of 8)

Number/ Issue Date	Description
2-F-H-22-92 July 13	Opens waters of the Chenik and Bruin Bay Subdistricts in the Kamishak Bay District, including the waters of the Chenik Lake Special Harvest Area (i.e. Chenik Lagoon), to commercial salmon fishing five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective at 6:00 a.m. Thursday, July 16, 1992, until further notice. Waters of the Chenik Lake Special Harvest Area remain open to the taking of salmon for purposes of hatchery cost recovery by agents of Cook Inlet Aquaculture Association seven days per week.
2-F-H-23-92 July 17	Reopens the Port Graham Subdistrict to subsistence salmon fishing effective 6:00 a.m. Monday, July 20, 1992, until further notice.
2-F-H-24-92 July 20	Reopens waters of the China Poot Special Harvest Area in the China Poot Subdistrict of the Southern District to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective 6:00 p.m. Monday, July 20, 1992, until further notice. The China Poot Special Harvest Area is defined as all marine waters of the China Poot Subdistrict east of a line connecting 59°34'00" N. latitude, 151°17'30" W. longitude on the north shore and 59°33'30" N. latitude, 151°17'32" W. longitude on the south shore.
2-F-H-25-92 July 30	Opens waters of Tutka Bay Subdistrict to commercial salmon seining five days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective 6:00 a.m. Thursday, July 30, 1992, until further notice. Tutka Lagoon will remain closed to commercial seining but open to the taking of salmon by agents of Cook Inlet Aquaculture Association seven days per week.

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Table 8. (page 8 of 8)

Number/ Issue Date	Description
2-F-H-26-92 July 31	<p>Opens waters of Windy Bay Subdistrict, Nuka Island Subdistrict, and those waters of Port Dick Subdistrict east of a line from the waterfall on the north shore at approximately 151°05'55" W. longitude to the island on the westernmost tip of Phillipino Cove at approximately 151°07' W. longitude, to commercial salmon seine fishing on a schedule of two 40-hour weekly fishing periods, from Monday, 6:00 a.m. until Tuesday 10:00 p.m. and from Thursday 6:00 a.m. until Friday 10:00 p.m., effective 6:00 a.m. Monday, August 3, 1992, until further notice.</p> <p>In addition, this emergency order closes those inside waters of the South Section of Port Dick Subdistrict between the waterfall at Port Dick Lake Creek and a marker at Shelter Cove to commercial salmon fishing effective 6:00 a.m. Monday, August 3, 1992, until further notice.</p>
2-F-H-27-92 August 3	<p>Closes waters of Halibut Cove Subdistrict, excluding Halibut Cove Lagoon, and also those waters of China Poot Subdistrict east of the longitude of the Kachemak Bay Wilderness Lodge at approximately 151°18'15" W. longitude, within the Southern District, to commercial salmon seining effective 6:00 a.m. Tuesday, August 4, 1992, until further notice. Waters of China Poot Subdistrict seaward of the longitude of the Kachemak Bay Wilderness Lodge and waters of Halibut Cove Lagoon remain open to salmon seining five days per week. Set gillnetting for salmon in the Halibut Cove Subdistrict also remains open five days per week.</p>
2-F-H-28-92 August 20	<p>Closes the Southern District (Kachemak Bay) subsistence salmon set gillnet fishery for coho salmon effective at 6:00 a.m. Saturday, August 22, 1992, for the remainder of the 1992 season.</p>

Table 9. Total return of adult pink salmon to the Tutka Bay Hatchery and the Halibut Cove Lagoon remote release site in the Southern District of Lower Cook Inlet, 1992.

COMMERCIAL HARVEST

Tutka Bay/Lagoon:	
Purse Seine	33,937
Set Gillnet	5,456
Cost Recovery	<u>275,957</u>
Tutka Commercial Harvest	315,350
Halibut Cove/Lagoon:	
Purse Seine	55,420
Set Gillnet	<u>2,775</u>
Halibut Cove/Lagoon Commercial Harvest	58,195

SPORT HARVEST

Tutka Lagoon	2,500
Halibut Cove Lagoon	0
Homer Spit Fishing Lagoon	<u>2,000</u>
Total Sport Catch	4,500

ESCAPEMENT

Tutka Creek and Channel	25,921
Tutka Hatchery Broodstock	<u>67,324</u>
Total Escapement	93,245

Total Return	471,290
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Table 10. Commercial purse seine catch of sac roe herring in short tons, and average roe recovery by statistical area and date, Kamishak Bay District, Lower Cook Inlet, 1992.

Date	Statistical Area & Location	No. of Permits	No. of Landings	Tons	Roe %
4/24	249-45 Kamishak/Douglas Reefs & Mushroom Islet	4	4	248.0	9.2
4/24	249-50 McNeil Cove	^a	1	52.0	8.7
4/24	249-55 Chenik Reef to Fortification Bluff	45	50	1,659.4	9.7
4/24	249-75 Contact Point	6	9	322.2	10.2
Totals		56	64	2,281.6	9.7

^a To comply with AS 16.05.815. CONFIDENTIAL NATURE OF CERTAIN REPORTS AND RECORDS, effort data has been masked where fewer than four vessels fished in a given area.

Table 11. Total biomass estimates and commercial catch of Pacific herring in short tons by age class, Kamishak Bay District, 1992, and 1993 forecast.

Age	1992 Estimated Biomass	1992 Commercial Harvest	Percent by Weight	1993 Forecast Biomass	Percent by Weight
1					
2					
3	100.2	9.5	0.4	0	0
4	11,210.7	1,062.4	46.6	358	1.2
5	3,359.8	318.4	14.0	19,109	66.3
6	1,266.3	120.0	5.3	3,659	12.4
7	1,307.4	123.9	5.4	1,522	5.3
8	3,852.6	365.1	16.0	908	3.2
9	1,520.6	144.1	6.3	1,899	6.6
10	408.4	38.7	1.7	885	3.1
11	611.0	57.9	2.5	166	0.6
12	93.9	8.9	0.4	153	0.5
13	111.9	10.6	0.5	33	0.1
14	234.3	22.2	1.0	45	0.2
15	0	0	0	160	0.6
TOTAL	24,077.0	2,281.6	100.0	28,805	100.0

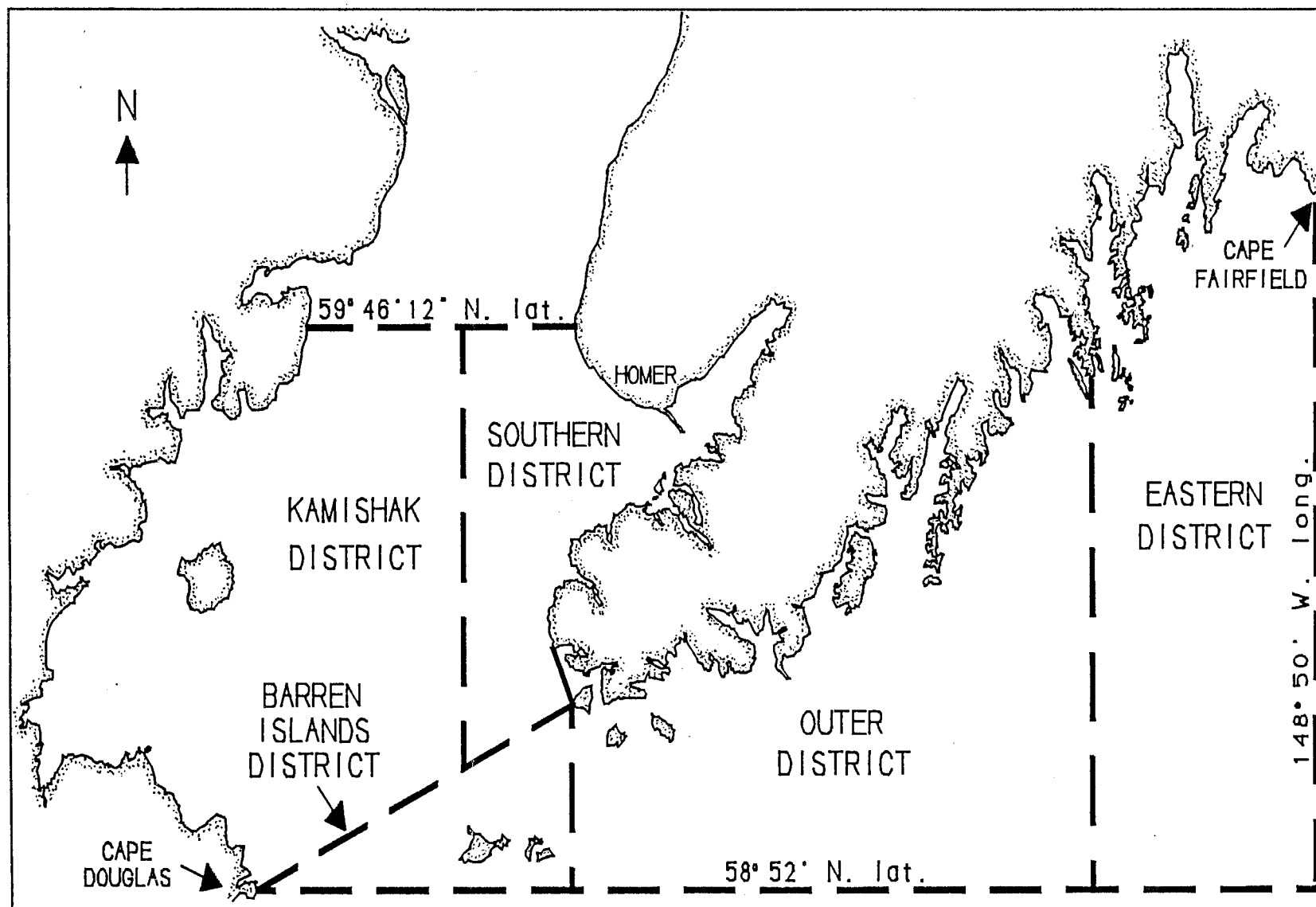


Figure 1. Lower Cook Inlet salmon and herring management area (not drawn to scale).

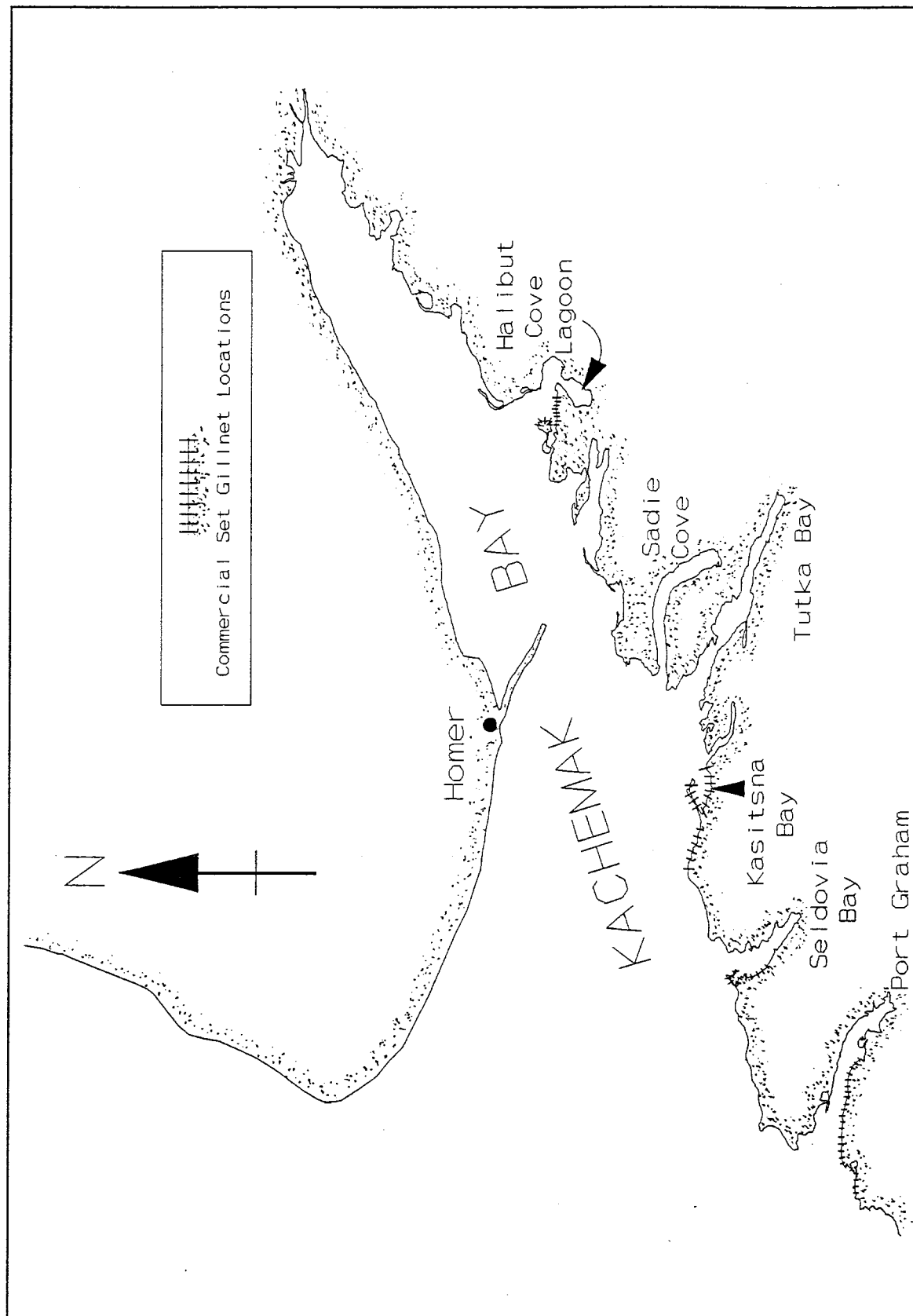


Figure 2. Commercial set gillnet locations in the Southern District of Lower Cook Inlet.

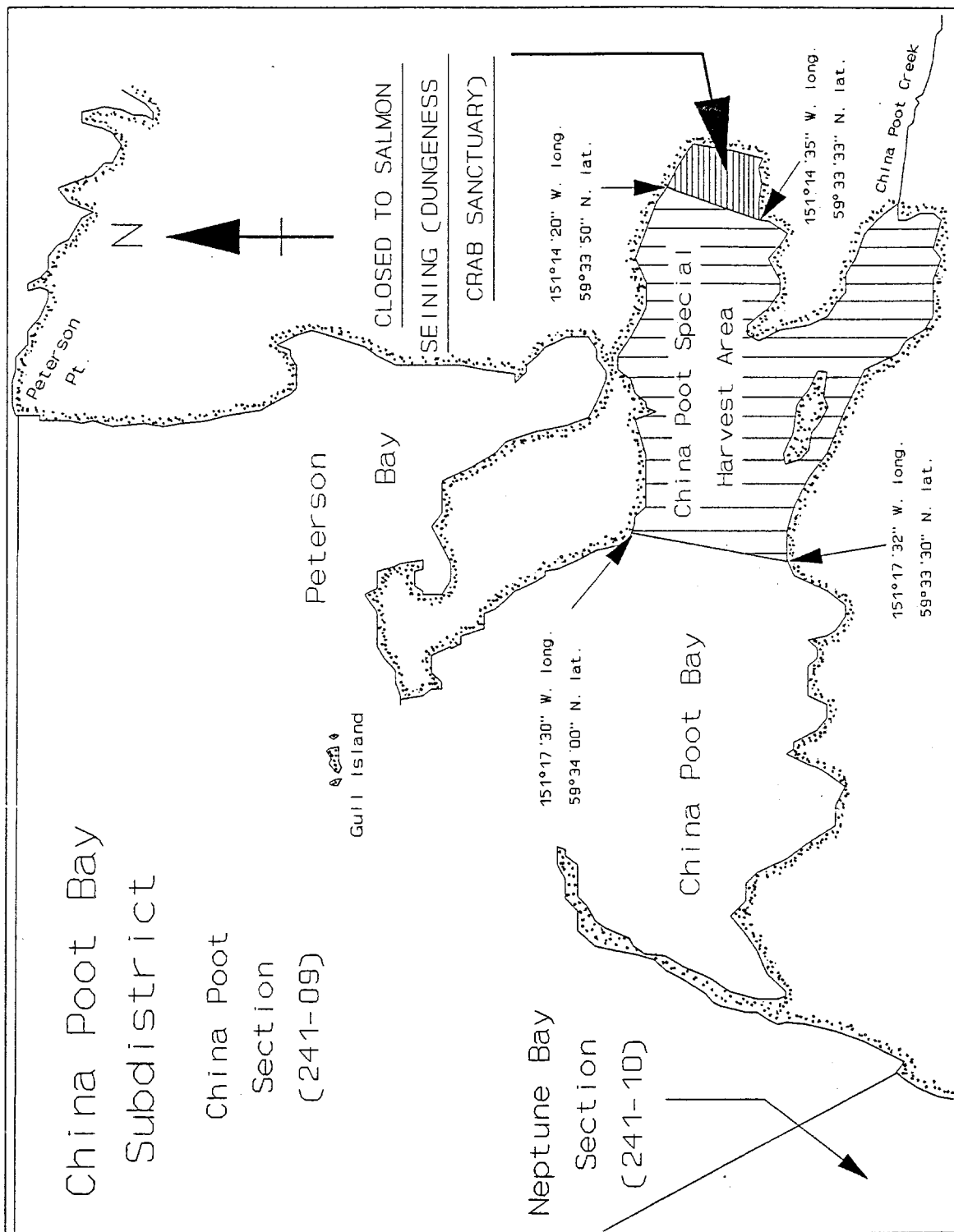


Figure 3. China Poot Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

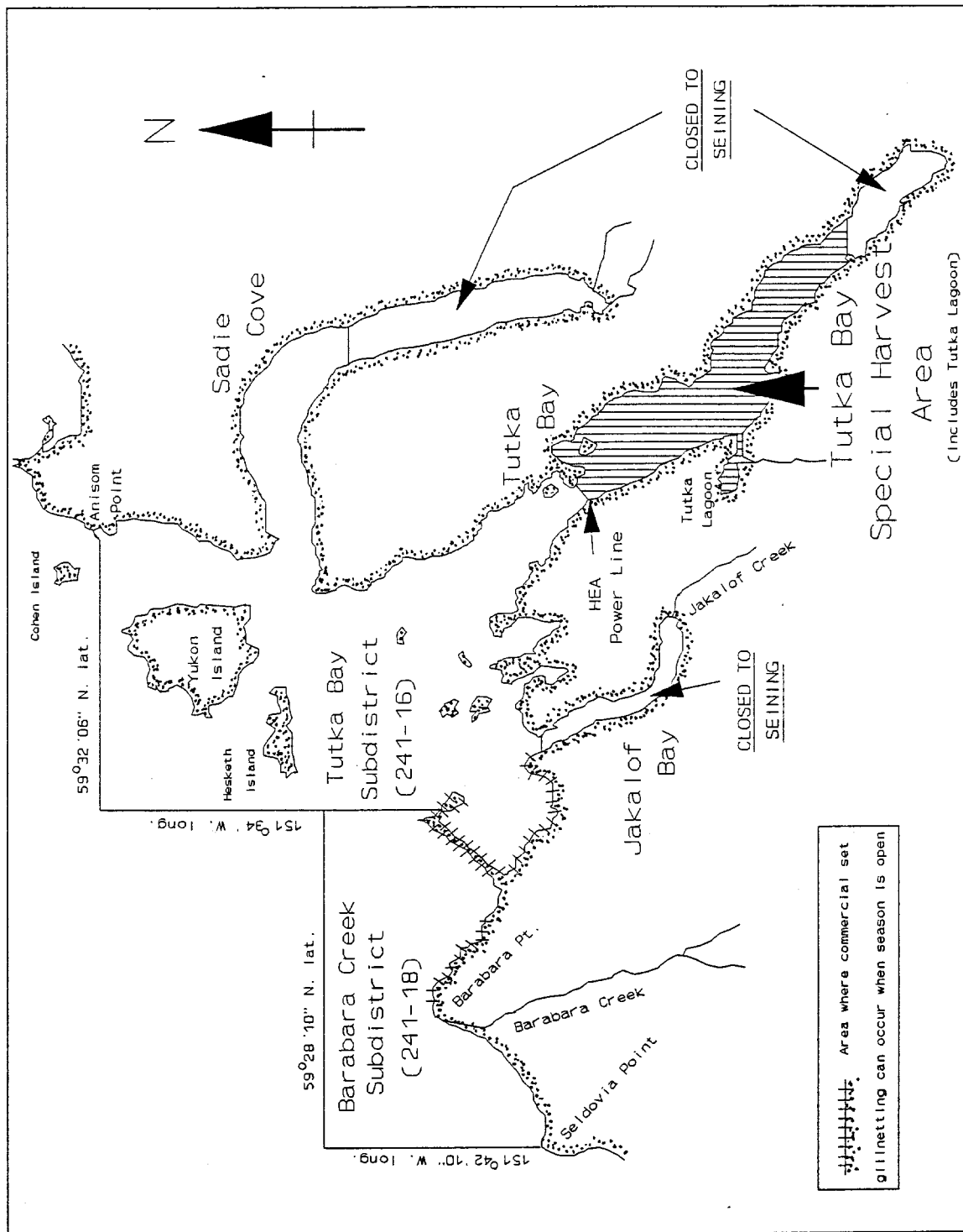


Figure 4. Tutka Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

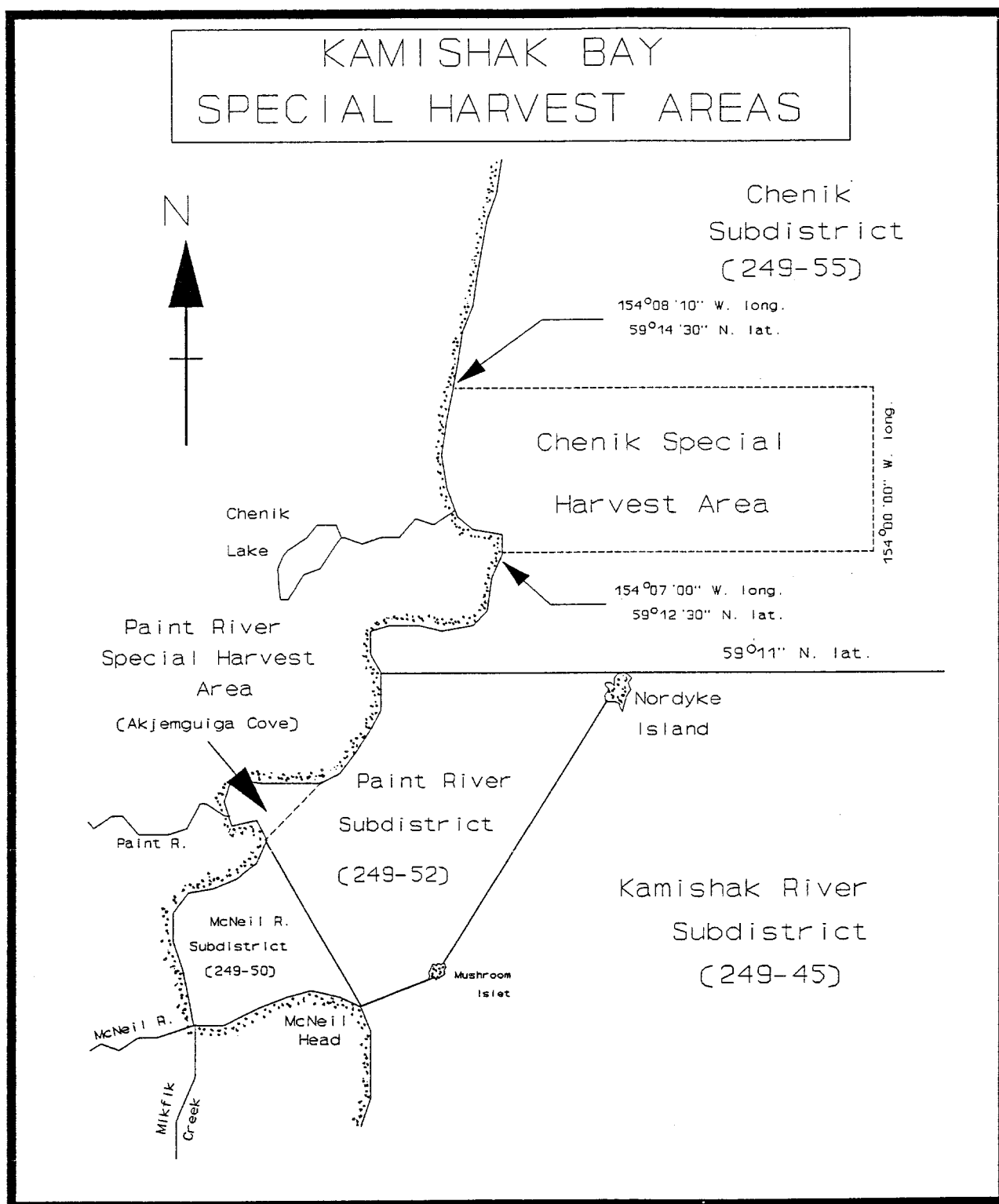


Figure 5. Chenik and Paint River Special Harvest Areas for salmon hatchery cost recovery in the Kamishak Bay District of Lower Cook Inlet.

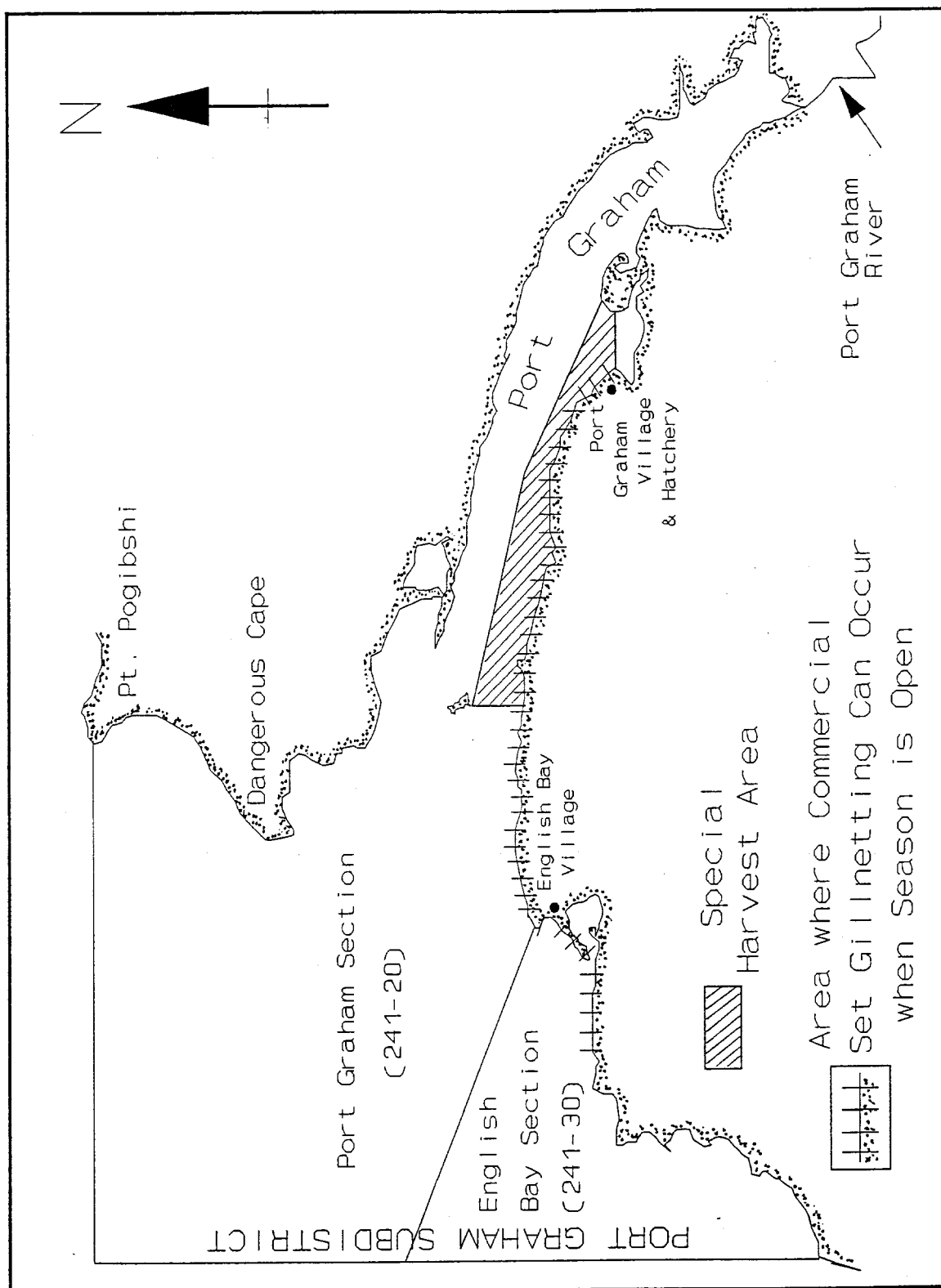


Figure 6. Port Graham Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

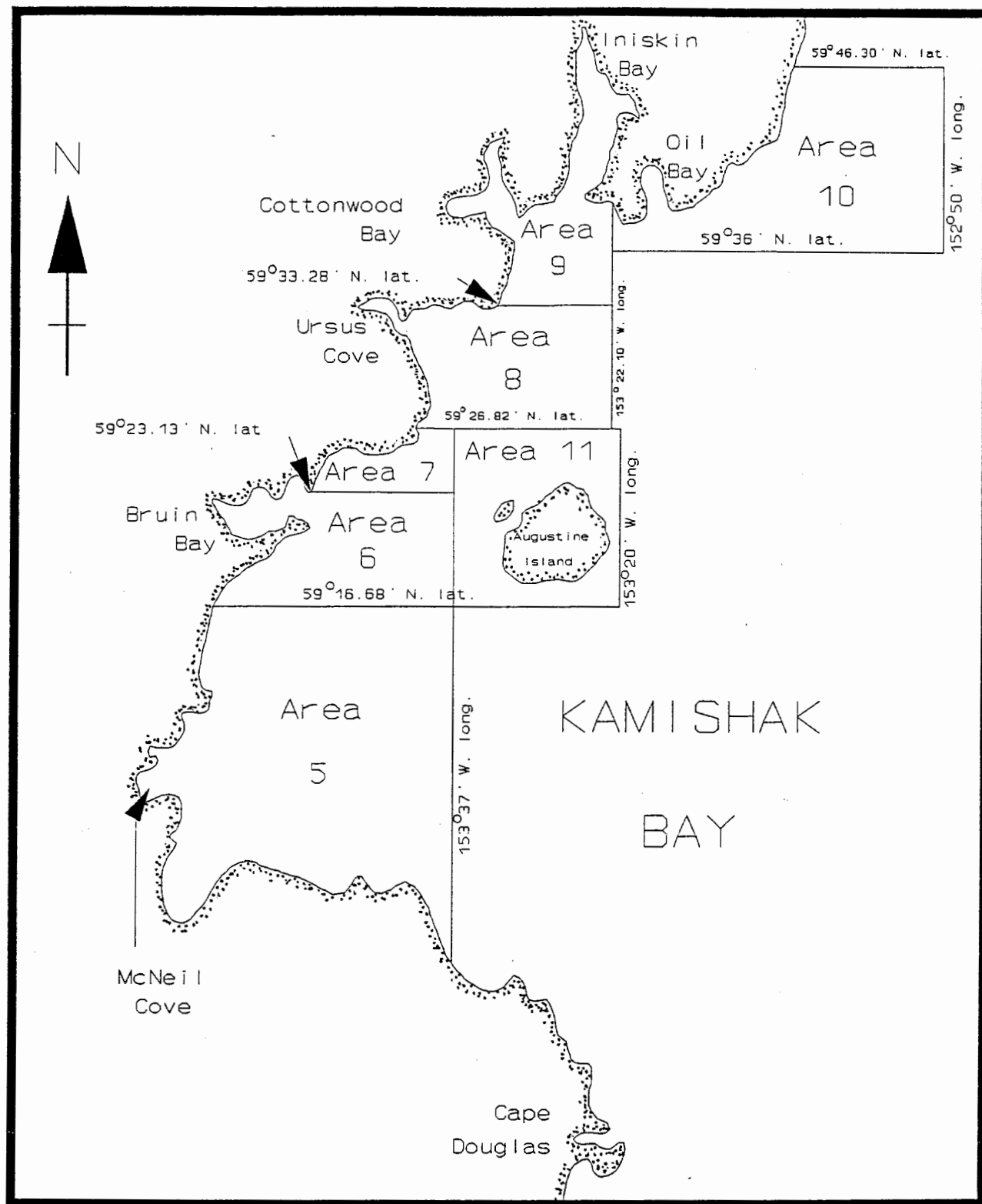


Figure 7. Commercial herring fishing areas in the Kamishak Bay District of the Lower Cook Inlet management area.

TOTAL LOWER COOK INLET SALMON HARVEST

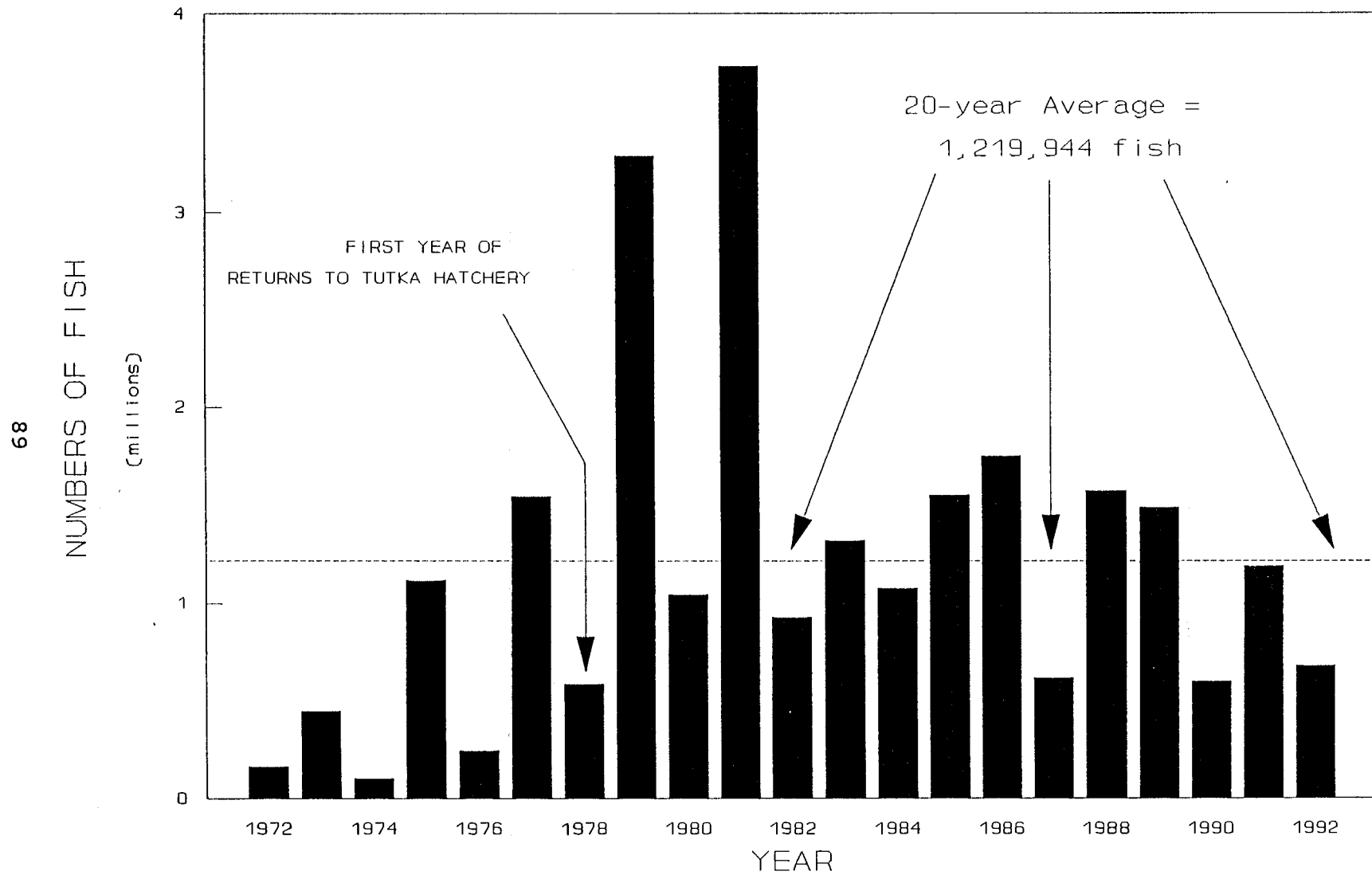


Figure 8.. Total commercial salmon catch, Lower Cook Inlet, 1972 - 1992.

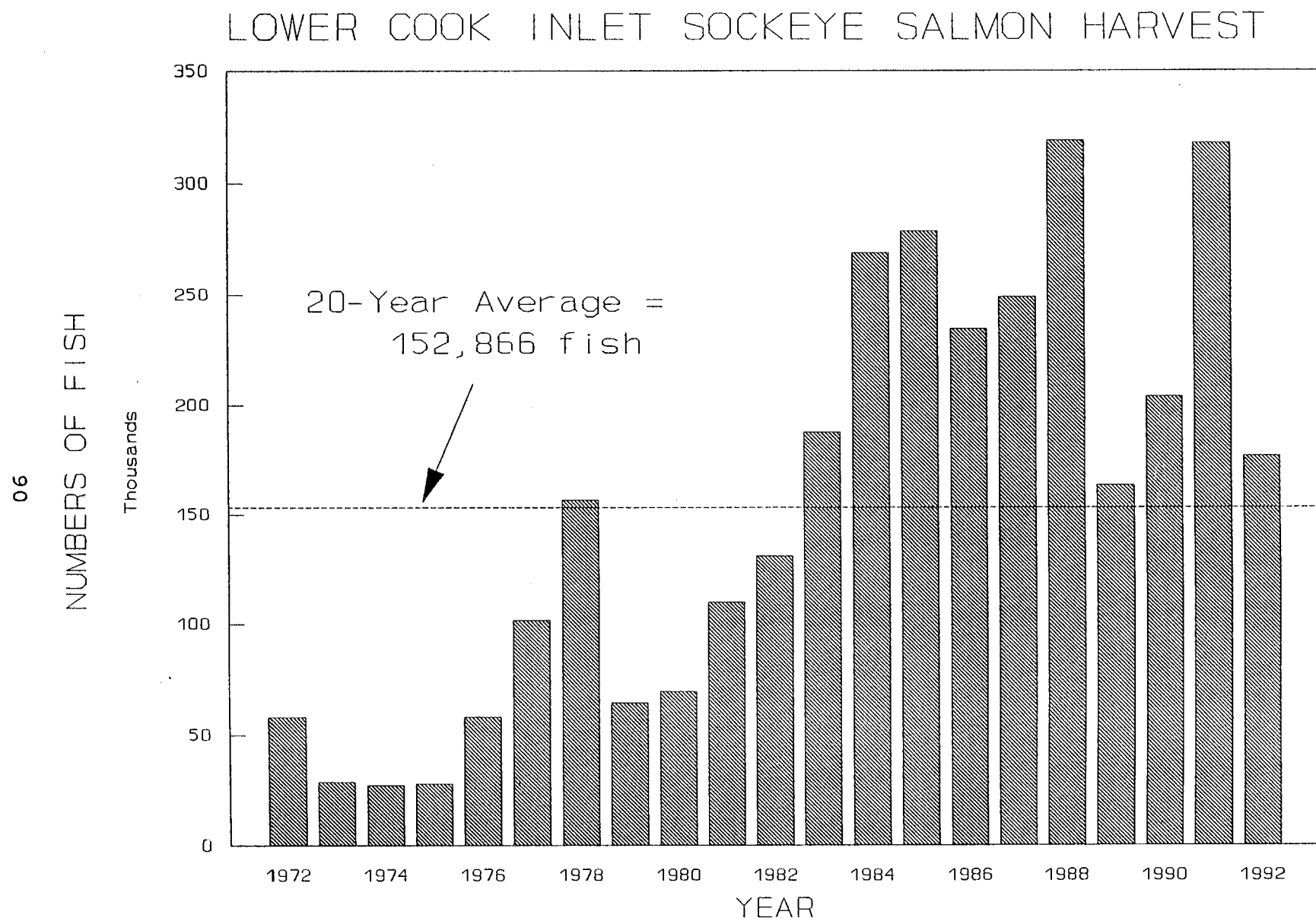


Figure 9.. Commercial sockeye salmon catch, Lower Cook Inlet, 1972 - 1992.

LEISURE LAKE SOCKEYE SALMON PRODUCTION

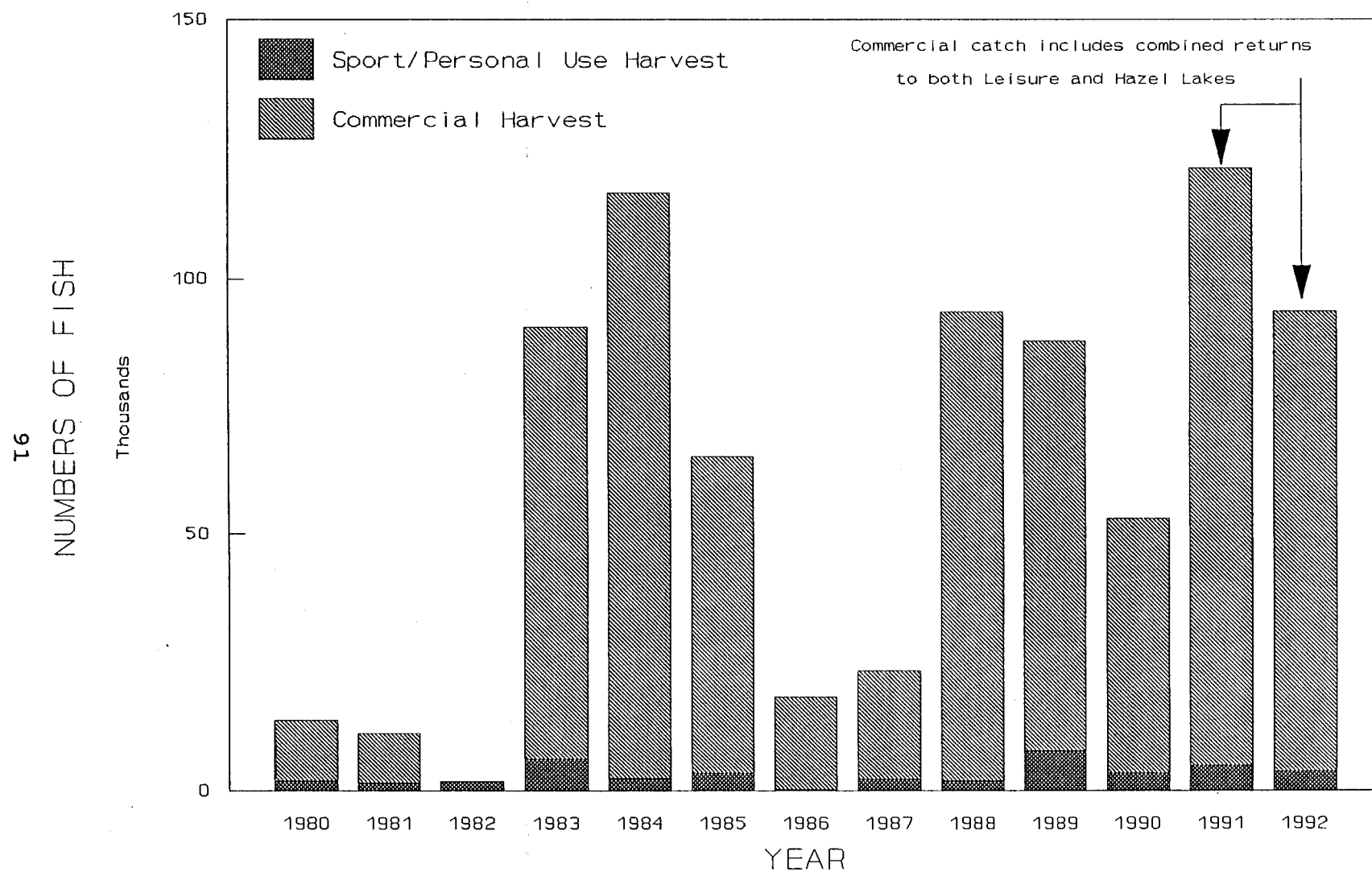


Figure 10. Sockeye salmon returns to Leisure Lake in the Southern District of Lower Cook Inlet, 1980 - 1992.

CHENIK LAKE SOCKEYE SALMON RETURNS

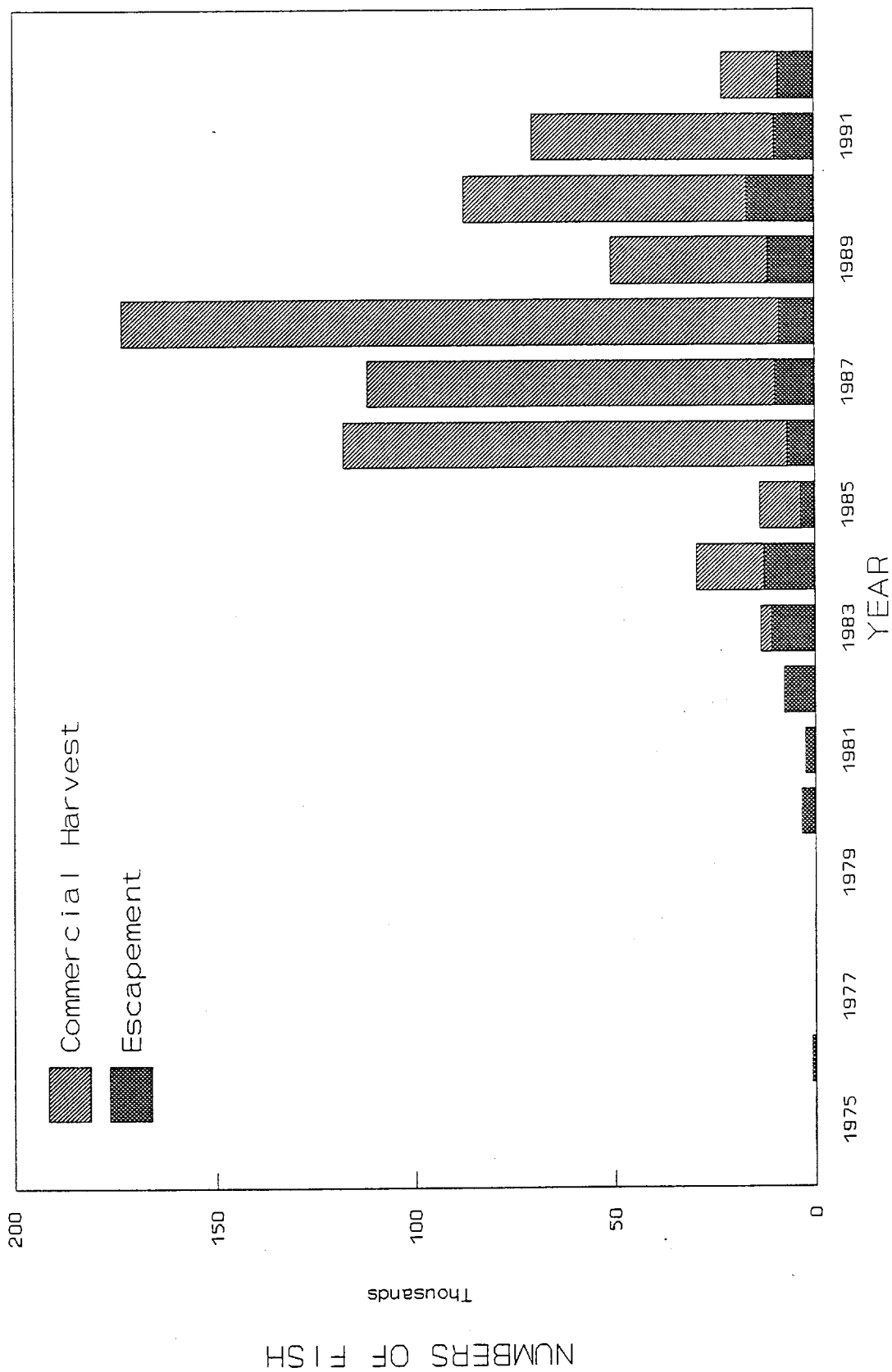


Figure 11. Sockeye salmon returns to Chenik Lake in the Kamishak Bay District of Lower Cook Inlet, 1975 - 1992.

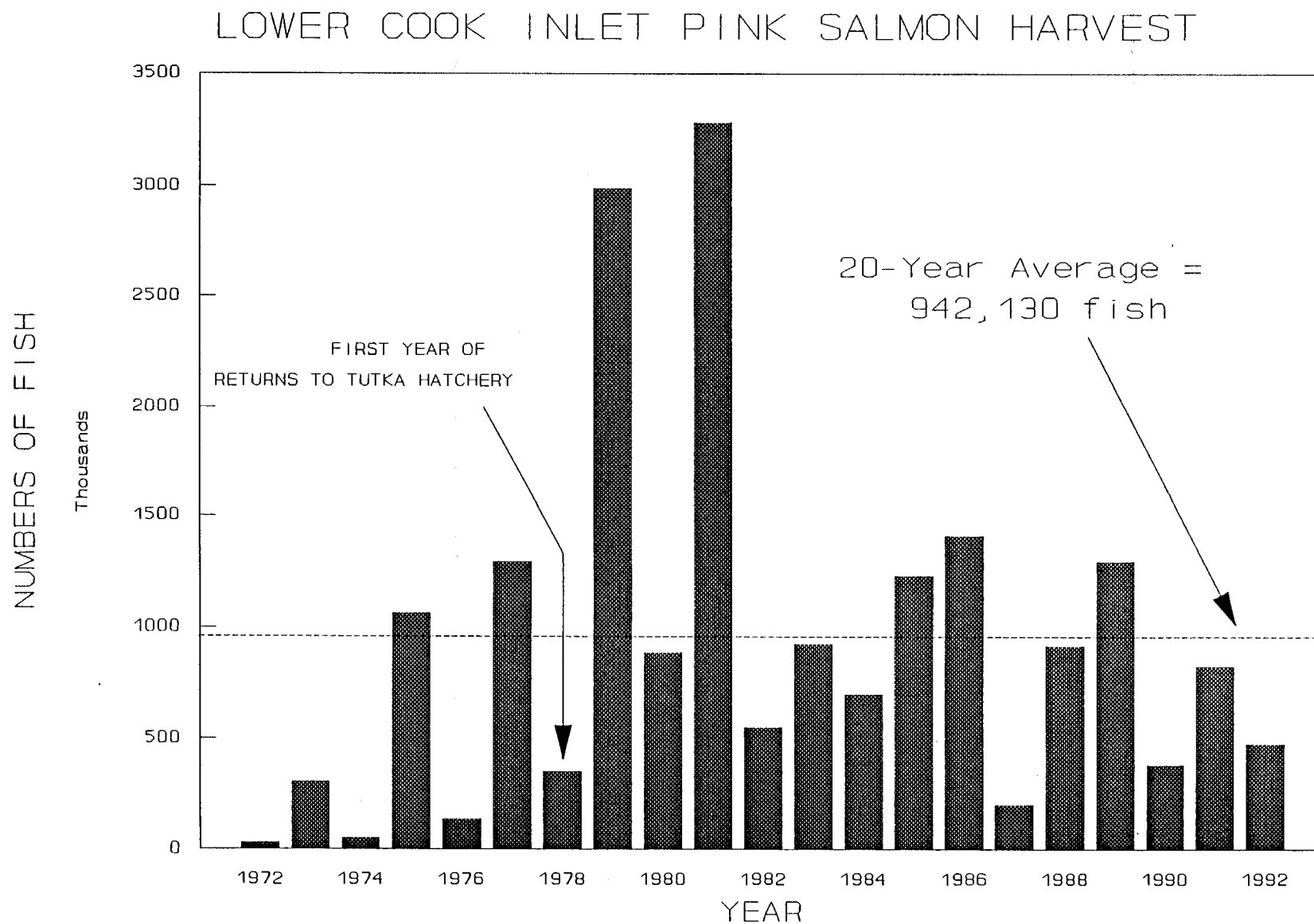


Figure 12. Commercial pink salmon catch, Lower Cook Inlet, 1972 - 1992.

LOWER COOK INLET CHUM SALMON HARVEST

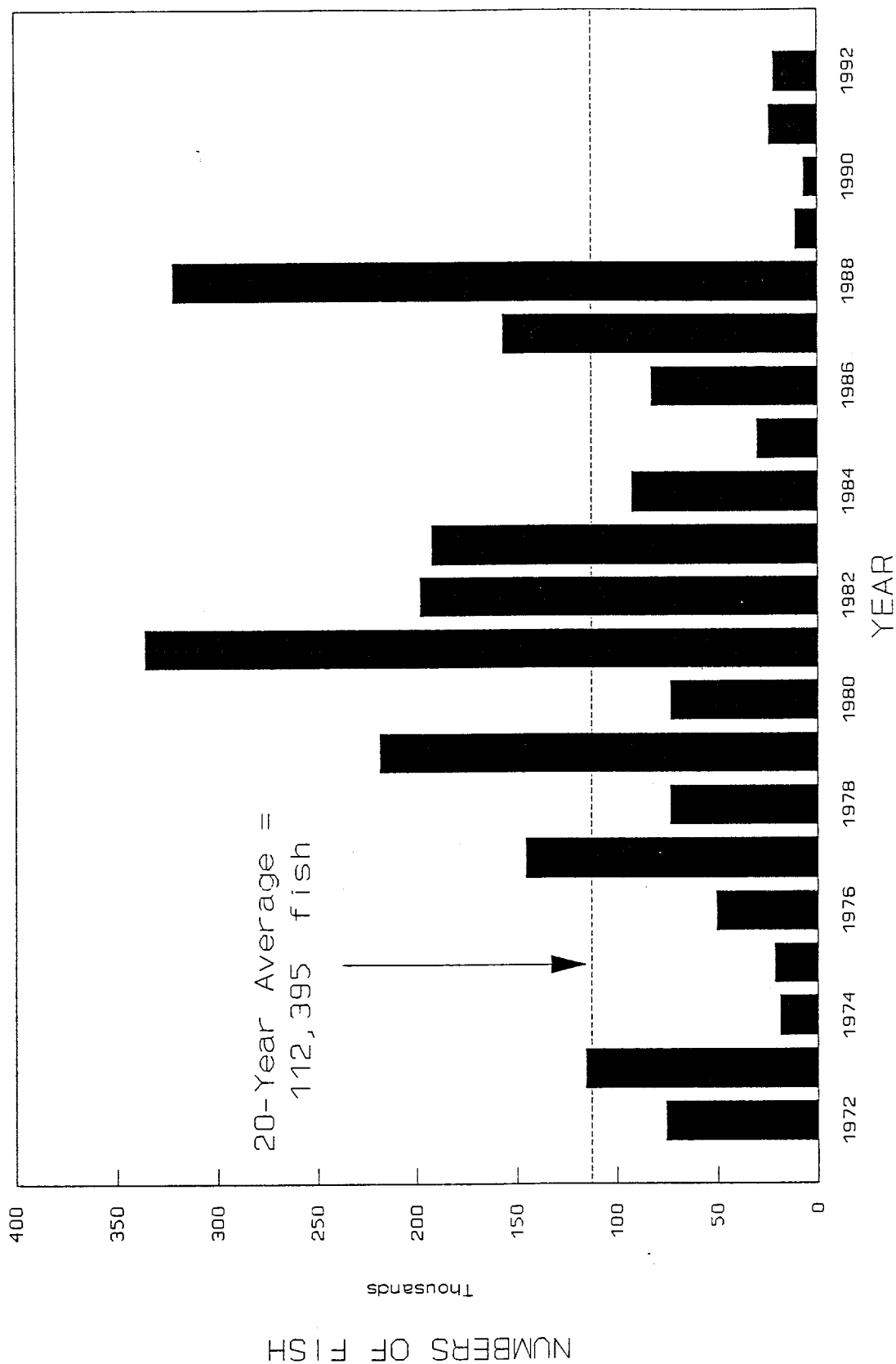


Figure 13. Commercial chum salmon catch, Lower Cook Inlet, 1972 - 1992.

KAMISHAK BAY DISTRICT HERRING BIOMASS TOTAL INSHORE RETURNS 1978-92 and 1993 FORECAST

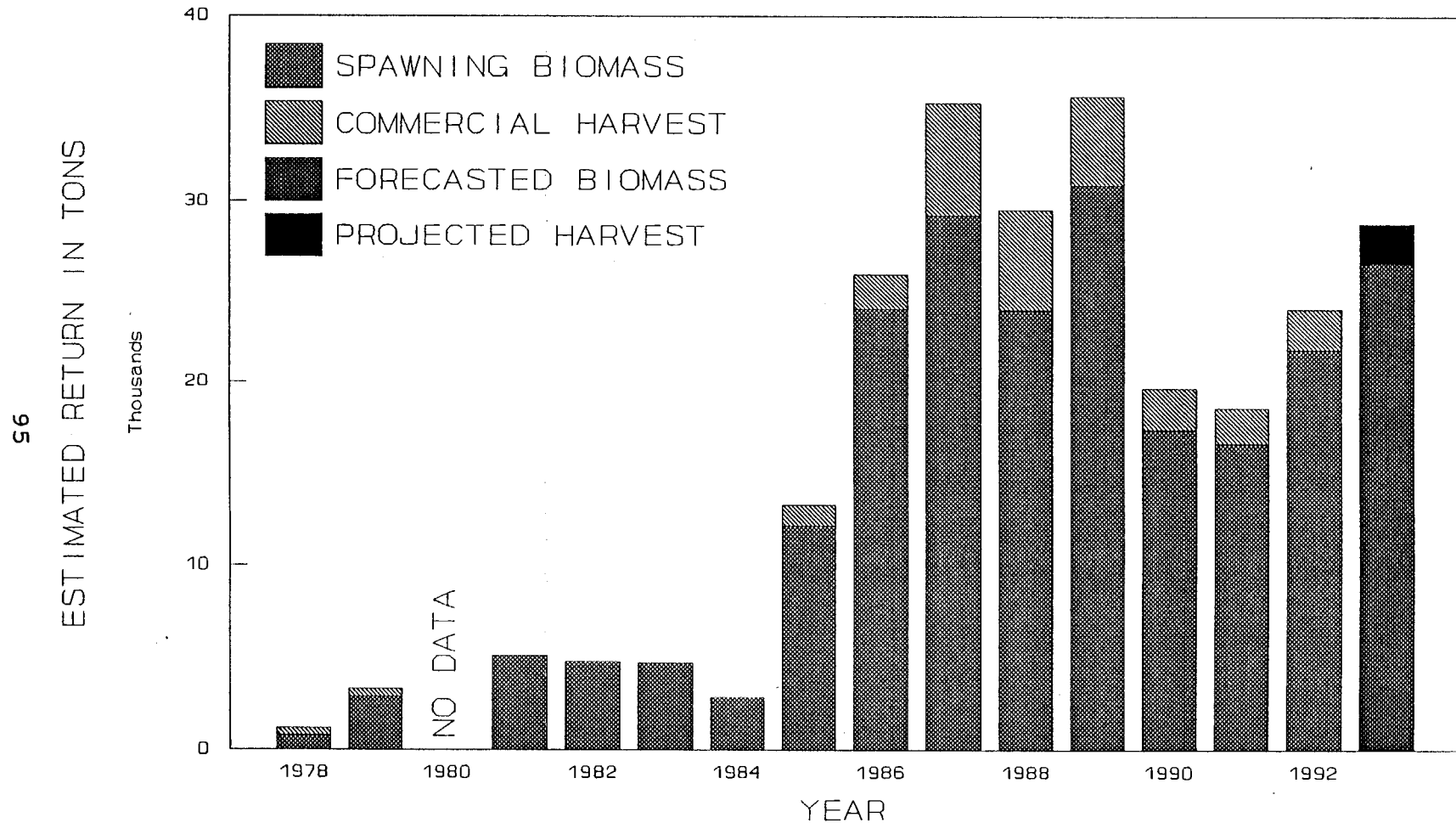


Figure 14. Biomass estimates and commercial harvests of Pacific herring in the sac roe seine fishery, Kamishak Bay District, Lower Cook Inlet, 1978 - 1992, and 1993 projection.

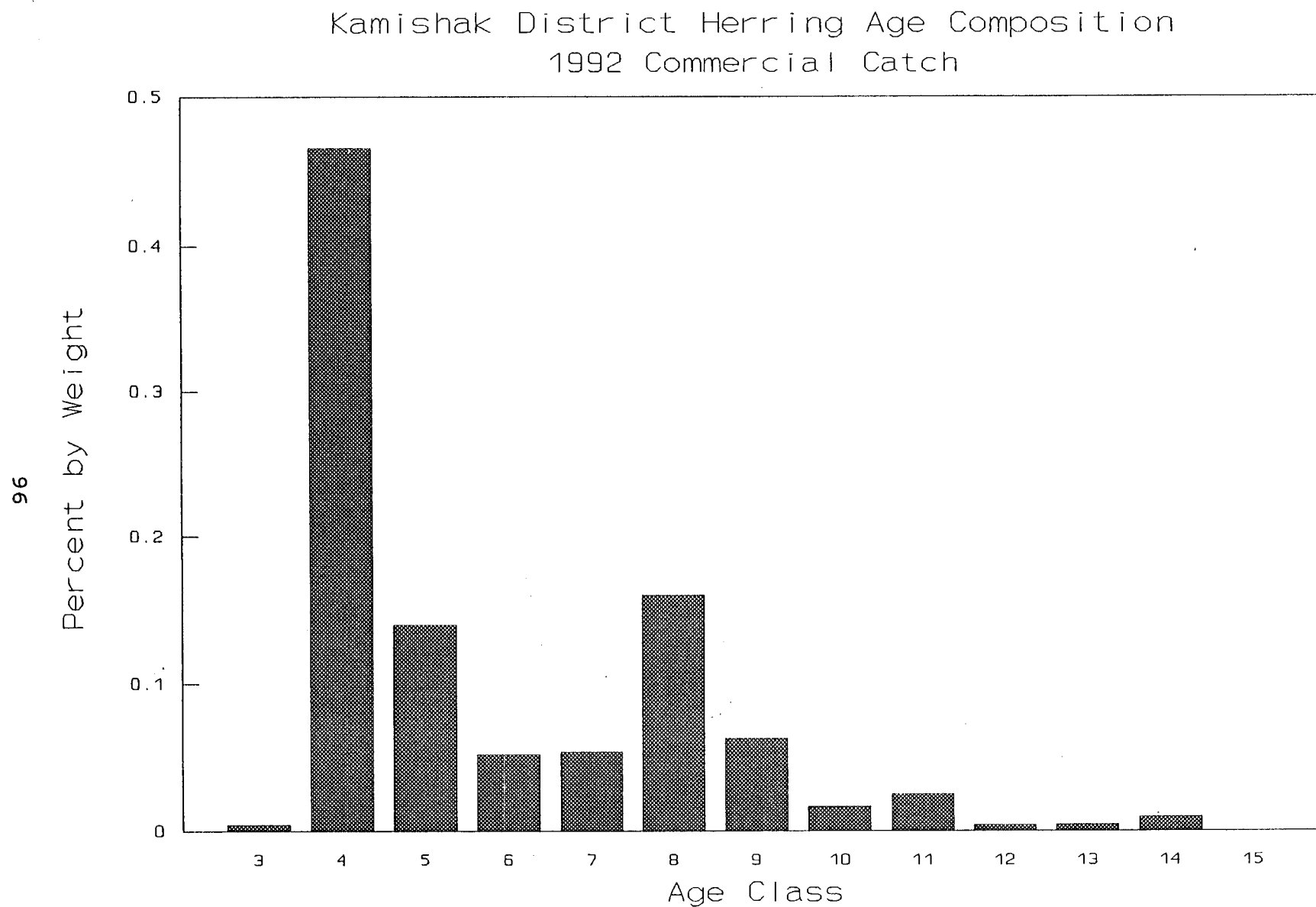


Figure 15. Weighted age class composition of the Pacific herring commercial sac roe harvest, Kamishak Bay District, Lower Cook Inlet, 1992.

Appendix Table 1. Salmon fishing permits issued and fished, by gear type, Lower Cook Inlet, 1975 - 1992^a.

Year	Purse Seines				
	Permanent Permit	Interim Permit	Total Issued	Actively Fished	Set Nets Fished
1975	49	51	100	63	27
1976	63	16	79	53	25
1977	72	10	82	72	26
1978	74	9	83	72	39
1979	75	9	84	75	38
1980	75	9	84	83	40
1981	75	10	85	85	40
1982	77	7	84	69	39
1983	78	5	83	83	24
1984	78	3	81	54	35
1985	80	1	81	51	34
1986	79	0	79	62	34
1987	79	0	79	66	29
1988	79	0	79	71	27
1989	83	0	83	64	23
1990	82	1	83	71	20
1991	82	1	83	68	20
1992	82	1	83	63	21
1975-91 Average	75	8	83	68	31

^a Data source: Commercial Fisheries Entry Commission and final IBM computer runs.

Appendix Table 2. Exvessel value of the commercial salmon harvest in thousands of dollars by species, Lower Cook Inlet, 1972 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1972	1	130	6	22	146	305
1973	3	113	5	310	251	682
1974	5	283	30	100	77	495
1975	3	106	27	1,456	71	1,663
1976	7	287	13	207	217	731
1977	7	620	9	1,719	604	2,959
1978	62	1,516	52	370	341	2,341
1979	36	621	68	4,495	1,097	6,317
1980	12	336	64	1,196	298	1,906
1981	18	740	69	5,334	1,346	7,507
1982	28	827	367	406	820	2,448
1983	20	704	57	696	513	1,990
1984	23	1,393	120	635	242	2,413
1985	47	1,637	86	974	78	2,822
1986	21	1,414	132	1,245	201	3,013
1987	27	1,951	118	295	598	2,989
1988	32	3,812	127	2,237	2,548	8,756
1989	33	1,213	59	1,660	39	3,004
1990	29	1,287	28	306	31	1,681
1991	19	1,115	36	275	48	1,495 ^b
1992	30	1,151	20	213	52	1,466 ^b
1972-91 Average	22	1,005	74	1,197	478	2,776

^a Values obtained by using the formula: (average price per lb.) x (average weight of fish) x (catch) = Exvessel value; average prices are determined only from fish ticket information and do not reflect any retroactive or postseason adjustments.

^b Includes hatchery cost recovery.

Appendix Table 3. Average salmon price in dollars per pound by species, Lower Cook Inlet, 1972 - 1992.^a

Year	Chinook	Sockeye	Coho	Pink	Chum
1972	0.45	0.36	0.44	0.20	0.28
1973	0.93	0.48	0.39	0.27	0.29
1974	0.76	1.54	0.72	0.48	0.56
1975	0.61	0.61	0.49	0.37	0.43
1976	0.91	0.77	0.59	0.37	0.48
1977	1.07	0.86	0.55	0.35	0.45
1978	1.09	1.31	0.97	0.30	0.54
1979	1.54	1.53	0.89	0.43	0.60
1980	1.30	0.88	0.85	0.42	0.52
1981	1.35	1.10	0.75	0.44	0.49
1982	1.29	1.05	0.87	0.23	0.46
1983	1.00	0.75	0.70	0.25	0.29
1984	1.29	1.05	0.77	0.26	0.28
1985	1.60	1.25	0.85	0.22	0.31
1986	1.25	1.40	0.85	0.26	0.30
1987	1.25	1.60	1.00	0.42	0.46
1988	1.25	2.50	1.80	0.80	0.84
1989	1.25	1.60	0.70	0.40	0.40
1990	1.35	1.55	0.60	0.30	0.50
1991	1.12	0.83	0.29	0.13	0.27
1992	1.29	1.47	0.43	0.14	0.27
20-Year Average	1.13	1.15	0.75	0.35	0.44
1972-81 Average	1.00	0.94	0.66	0.36	0.46
1982-91 Average	1.27	1.36	0.84	0.33	0.41

^a Average prices are determined only from fish ticket information and do not reflect any retroactive or postseason adjustments.

Appendix Table 4. Salmon average weight in pounds per fish by species in the commercial fishery, Lower Cook Inlet, 1972 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum
1972	25.0	6.2	6.1	3.9	6.9
1973	22.3	8.1	6.1	3.7	7.4
1974	36.1	6.7	6.4	4.1	7.2
1975	33.2	6.2	8.8	3.7	7.6
1976	16.1	6.4	7.0	4.1	8.9
1977	30.1	7.2	5.9	3.8	9.2
1978	32.3	7.4	8.2	3.5	8.6
1979	18.9	6.3	6.2	3.5	8.2
1980	21.7	5.5	5.2	3.2	7.8
1981	12.5	6.1	8.5	3.7	8.1
1982	20.6	6.0	9.0	3.2	9.0
1983	22.8	5.0	7.2	3.0	9.2
1984	28.8	4.7	8.8	3.5	8.9
1985	28.0	4.7	9.8	3.5	8.2
1986	20.6	4.3	8.6	3.4	8.1
1987	18.1	4.9	8.2	3.5	8.3
1988	15.3	4.8	8.9	3.0	9.4
1989	14.1	4.6	7.0	3.1	8.6
1990	13.8	4.1	7.1	2.8	8.9
1991	12.3	4.2	6.6	2.6	7.5
1992	12.3	4.4	7.7	3.2	8.8
1972-91 Average	22.1	5.7	7.5	3.4	8.3

^a Values obtained from commercial fish catch & production statistical leaflets (1971-74); remaining years from IBM computer runs.

Appendix Table 5. Commercial salmon catch in numbers of fish by species, Lower Cook Inlet, 1972 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1972	88	57,897	2,234	28,663	75,543	164,425
1973	145	29,136	2,101	307,403	115,513	454,298
1974	183	27,428	6,514	50,601	19,210	103,936
1975	142	28,142	6,211	1,063,338	21,646	1,119,479
1976	450	58,159	3,216	136,445	50,822	249,092
1977	217	101,597	1,798	1,293,932	145,789	1,543,333
1978	1,747	156,404	6,529	352,561	73,518	590,759
1979	1,238	64,417	12,393	2,990,929	218,490	3,287,467
1980	424	69,442	14,505	889,703	73,492	1,047,566
1981	1,086	110,255	10,776	3,279,183	336,093	3,737,393
1982	1,066	131,320	46,892	551,589	198,185	929,052
1983	873	187,645	11,219	927,607	192,319	1,319,663
1984	714	268,950	16,797	700,622	92,540	1,079,623
1985	1,043	278,694	10,327	1,229,708	30,640	1,550,412
1986	796	234,861	18,852	1,408,293	82,688	1,745,490
1987	1,179	248,848	14,354	201,429	157,018	622,828
1988	1,694	319,008	7,946	921,296	321,911	1,571,855
1989	1,893	163,271	12,089	1,296,926	11,305	1,485,484
1990	1,560	203,895	9,297	383,670	6,951	605,373
1991	1,419	317,947	19,047	828,709	24,232	1,191,354
1992	1,891	176,644	5,902	479,768	22,203	686,408
20-Year Avg.	898	152,866	11,655	942,130	112,395	1,219,944
1972-81 Avg.	572	70,288	6,628	1,039,276	113,012	1,229,775
1982-91 Avg.	1,224	235,444	16,682	844,985	111,779	1,210,113
'92 % of Ttl.	0.28	25.73	0.86	69.90	3.23	100.00

^a Data source: Final IBM computer runs.

Appendix Table 6. Commercial salmon catch in numbers of fish by species in the Southern District, Lower Cook Inlet, 1972 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1972	69	31,345	1,283	9,126	4,936	46,759
1973	139	24,072	1,241	97,574	3,588	126,614
1974	182	27,029	3,054	48,875	2,725	81,865
1975	142	27,393	3,039	893,615	5,428	929,617
1976	442	35,280	1,905	99,817	1,517	138,961
1977	182	54,663	1,255	157,025	6,734	219,859
1978	1,511	141,088	4,318	251,761	5,525	404,203
1979	1,199	37,342	10,846	986,909	8,221	1,044,517
1980	414	42,929	11,568	478,019	4,605	537,535
1981	1,024	77,880	7,976	1,453,982	20,920	1,561,782
1982	926	43,433	7,165	296,556	18,466	366,546
1983	858	133,671	3,433	690,254	14,281	842,497
1984	661	160,654	3,193	336,595	8,065	509,168
1985	1,007	84,149	4,258	518,889	5,513	613,816
1986	776	36,838	3,095	542,521	5,560	588,790
1987	1,158	89,662	2,163	90,522	5,030	188,535
1988	1,655	105,302	2,987	852,382	7,742	970,068
1989	1,889	98,052	6,667	987,488	3,141	1,097,237
1990	1,546	82,412	1,522	178,087	2,433	266,030
1991	1,399	170,224	9,415	253,962	1,962	436,962
1992	1,852	106,793	1,277	417,021	1,885	528,828
20-Year Avg.	859	75,171	4,521	461,198	6,820	548,568
1972-81 Avg.	530	49,902	4,649	447,670	6,420	509,171
1982-91 Avg.	1,188	100,440	4,393	474,726	7,219	528,788
'92 % of Ttl.	0.35	20.19	0.24	78.86	0.36	100.0

^a Data source: Final IBM computer runs.

Appendix Table 7. Commercial salmon set gillnet catch in numbers of fish by species in the Southern District, Lower Cook Inlet, 1972 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1972	69	31,340	323	6,303	2,819	40,854
1973	134	23,970	1,089	20,222	2,374	47,789
1974	175	26,996	3,010	11,097	2,713	43,991
1975	96	26,588	2,337	49,490	4,020	82,531
1976	176	33,993	1,321	13,412	1,353	50,255
1977	175	54,404	869	38,064	2,765	96,277
1978	1,052	86,934	3,053	11,556	4,117	106,712
1979	483	34,367	7,595	69,368	5,266	117,079
1980	225	29,922	8,038	26,613	2,576	67,374
1981	222	53,665	6,735	68,794	8,524	137,940
1982	894	42,389	5,557	15,838	7,113	71,791
1983	822	41,707	1,799	20,533	4,377	69,238
1984	639	40,987	2,862	17,836	5,008	67,332
1985	958	23,188	3,908	22,898	4,221	55,173
1986	745	21,807	2,827	14,244	2,426	42,049
1987	653	28,209	2,025	9,224	2,419	42,530
1988	1,145	14,758	2,819	29,268	4,423	52,413
1989	1,281	13,970	4,792	16,210	1,877	38,130
1990	1,361	15,863	1,046	12,646	1,938	32,854
1991	842	20,525	5,011	3,954	1,577	31,909
1992	1,288	17,002	848	15,958	1,687	36,783
20-Year Avg.	607	33,279	3,351	23,879	3,595	64,711
1972-81 Avg.	281	40,218	3,437	31,492	3,653	79,080
1982-91 Avg.	934	26,340	3,265	16,265	3,538	50,342
'92 % of Ttl.	3.51	46.22	2.31	43.38	4.59	100.00

^a Data source: Final IBM computer runs.

Appendix Table 8. Commercial salmon catch in numbers of fish by species in the Outer District, Lower Cook Inlet, 1972 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1972	7	26,092	17	963	43,466	70,545
1973	1	2,006	31	195,342	76,286	273,666
1974	1	206	21	1,300	11,924	13,452
1975	0	124	7	159,908	11,348	171,387
1976	7	18,886	0	93	412	19,398
1977	34	33,733	78	1,129,250	70,167	1,233,262
1978	236	10,695	45	70,080	19,224	100,280
1979	30	25,297	135	1,945,536	180,558	2,151,556
1980	10	22,514	16	154,041	32,246	208,827
1981	61	18,133	485	1,714,115	238,393	1,971,187
1982	129	66,781	92	67,523	63,075	197,600
1983	14	16,835	54	199,794	27,203	243,900
1984	3	29,276	41	89,085	3,204	121,609
1985	19	91,957	3,210	618,222	11,844	725,252
1986	6	48,472	5,052	401,755	11,701	466,986
1987	14	31,845	2,481	23,890	28,663	86,893
1988	5	9,501	2	6,094	71,202	86,804
1989	1	10,286	72	52,677	43	63,079
1990	2	17,404	74	191,320	614	209,414
1991	2	6,408	12	359,664	14,337	380,423
1992	0	572	1	146	181	900
20-Year Avg.	29	24,323	596	369,033	45,796	439,776
1972-81 Avg.	39	15,769	84	537,063	68,402	621,356
1982-91 Avg.	20	32,877	1,109	201,002	23,189	258,196
'92 % of Ttl.	0.00	63.56	0.11	16.22	20.11	100.0

^a Data source: Final IBM computer runs.

Appendix Table 9. Commercial salmon catch in numbers of fish by species in the Eastern District, Lower Cook Inlet, 1972 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1972	12	413	903	18,232	767	20,327
1973	5	3,057	801	1,919	55	5,837
1974	0	193	524	378	7	1,102
1975	0	596	124	383	2	1,105
1976	0	5	200	35,423	45	35,673
1977	0	5,776	360	1,349	3,229	10,714
1978	0	2	582	29,738	100	30,422
1979	0	0	296	0	0	296
1980	0	122	426	155,779	720	157,047
1981	0	9,270	470	44,989	3,279	58,008
1982	0	3,092	950	143,639	7,698	155,379
1983	0	25,932	594	36,154	7,934	70,614
1984	47	54,420	536	136,797	10,535	202,335
1985	11	24,338	835	92,403	5,144	122,731
1986	0	3,055	770	40,243	3,757	47,825
1987	0	3,687	1,631	14,333	14,913	34,564
1988	1	20,253	486	1,740	24,668	47,148
1989	0	8,538	5,346	92	312	14,288
1990	0	7,682	7,645 ^b	11,815	307	27,449
1991	1	4,703	7,283 ^b	167,250	80	179,317
1992	0	432	3,136 ^b	60,007	86	63,661
20-Year Avg.	4	8,757	1,538	46,633	4,178	61,109
1972-81 Avg.	2	1,943	469	28,819	820	32,053
1982-91 Avg.	6	15,570	2,608	64,447	7,535	90,165
'92 % of Ttl.	0.00	0.68	4.93	94.26	0.14	100.0

^a Data source: Final IBM computer runs.

^b Includes commercial seine catches, Seward Silver Salmon Derby entries, and fish taken for hatchery cost recovery purposes.

Appendix Table 10. Commercial salmon catch in numbers of fish by species in the Kamishak Bay District, Lower Cook Inlet, 1972 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1972	0	47	31	342	26,374	26,794
1973	0	1	28	12,568	35,584	48,181
1974	0	0	2,915	48	4,554	7,517
1975	0	29	3,041	9,432	4,868	17,370
1976	1	3,988	1,111	1,112	48,848	55,060
1977	1	7,425	105	6,308	65,659	79,498
1978	0	4,619	1,584	982	48,669	55,854
1979	9	1,778	1,116	58,484	29,711	91,098
1980	0	3,877	2,495	101,864	35,921	144,157
1981	1	4,972	1,845	66,097	73,501	146,416
1982	11	18,014	38,685	43,871	108,946	209,527
1983	1	11,207	7,138	1,405	142,901	162,652
1984	3	24,600	13,027	138,145	70,736	246,511
1985	6	78,250	2,024	194	8,139	88,613
1986	14	146,496	9,935	423,774	61,670	641,889
1987	7	123,654	8,079	72,684	108,412	312,836
1988	33	183,952	4,471	61,080	218,299	467,835
1989	3	46,395	4	256,669	7,809	310,880
1990	12	96,397	26	2,448	3,597	102,480
1991	17	136,612	2,337	47,833	7,853	194,652
1992	39	68,847	1,488	2,594	20,051	93,019
20-Year Avg.	6	44,616	5,000	65,267	55,603	170,491
1972-81 Avg.	1	2,674	1,427	25,724	37,369	67,195
1982-91 Avg.	11	86,558	8,573	104,810	73,836	273,788
'92 % of Ttl.	0.04	74.01	1.60	2.79	21.56	100.0

^a Data source: Final IBM computer runs.

Appendix Table 11. Total commercial salmon catch in numbers of fish by district, Lower Cook Inlet, 1972 - 1992^a.

Year	Southern	Outer	Kamishak	Eastern	Total
1972	46,759	70,545	26,794	20,327	164,425
1973	126,614	273,666	48,181	5,837	454,298
1974	81,865	13,452	7,517	1,102	103,936
1975	929,617	171,387	17,370	1,105	1,119,479
1976	138,961	19,398	55,060	35,673	249,092
1977	219,859	1,233,262	79,498	10,714	1,543,333
1978	404,203	100,280	55,854	30,422	590,759
1979	1,044,517	2,151,556	91,098	296	3,287,467
1980	537,535	208,827	144,157	157,047	1,047,566
1981	1,561,782	1,971,187	146,416	58,008	3,737,393
1982	366,546	197,600	209,527	155,379	929,052
1983	842,497	243,900	162,652	70,614	1,319,663
1984	509,168	121,609	246,511	202,335	1,079,623
1985	613,816	725,252	88,613	122,731	1,550,412
1986	588,790	466,986	641,889	47,825	1,745,490
1987	188,535	86,893	312,836	34,564	622,828
1988	970,068	86,804	467,835	47,148	1,571,855
1989	1,097,237	63,079	310,880	14,288	1,485,484
1990	266,030	209,414	102,480	27,449	605,373
1991	436,962	380,423	194,652	179,317	1,191,354
1992	528,828	900	93,019	63,661	686,408
20-Year Avg.	548,568	439,776	170,491	61,109	1,219,944
1972-81 Avg.	509,171	621,356	67,195	32,053	1,229,775
1982-91 Avg.	587,965	258,196	273,788	90,165	1,210,113
'92 % of Ttl.	77.04	0.13	13.55	9.27	100.00

^a Data source: Final IBM computer runs.

Appendix Table 12. Commercial chinook salmon catch in numbers of fish by district, Lower Cook Inlet, 1972-1992^a.

Year	Southern	Outer	Kamishak	Eastern	Total
1972	69	7	0	12	88
1973	139	1	0	5	145
1974	182	1	0	0	183
1975	142	0	0	0	142
1976	442	7	1	0	450
1977	182	34	1	0	217
1978	1,511	236	0	0	1,747
1979	1,199	30	9	0	1,238
1980	414	10	0	0	424
1981	1,024	61	1	0	1,086
1982	926	129	11	0	1,066
1983	858	14	1	0	873
1984	661	3	3	47	714
1985	1,007	19	6	11	1,043
1986	776	6	14	0	796
1987	1,158	14	7	0	1,179
1988	1,655	5	33	1	1,694
1989	1,889	1	3	0	1,893
1990	1,546	2	12	0	1,560
1991	1,399	2	17	1	1,419
1992	1,852	0	39	0	1,891
20-Year Avg.	859	29	6	4	898
1972-81 Avg.	530	39	1	2	572
1982-91 Avg.	1,188	20	11	6	1,224
'92 % of Ttl.	97.94	0.00	2.06	0.00	100.0

^a Data source: Final IBM computer runs.

Appendix Table 13. Commercial sockeye salmon catch in numbers of fish by district, Lower Cook Inlet, 1972-1992^a.

Year	Southern	Outer	Kamishak	Eastern	Total
1972	31,345	26,092	47	413	57,897
1973	24,072	2,006	1	3,057	29,136
1974	27,029	206	0	193	27,428
1975	27,393	124	29	596	28,142
1976	35,280	18,886	3,988	5	58,159
1977	54,663	33,733	7,425	5,776	101,597
1978	141,088	10,695	4,619	2	156,404
1979	37,342	25,297	1,778	0	64,417
1980	42,929	22,514	3,877	122	69,442
1981	77,880	18,133	4,972	9,270	110,255
1982	43,433	66,781	18,014	3,092	131,320
1983	133,671	16,835	11,207	25,932	187,645
1984	160,654	29,276	24,600	54,420	268,950
1985	84,149	91,957	78,250	24,338	278,694
1986	36,838	48,472	146,496	3,055	234,861
1987	89,662	31,845	123,654	3,687	248,848
1988	105,302	9,501	183,952	20,253	319,008
1989	98,052	10,286	46,395	8,538	163,271
1990	82,412	17,404	96,397	7,682	203,895
1991	170,224	6,408	136,612	4,703	317,947
1992	106,793	572	68,847	432	176,644
20-Year Avg.	75,171	24,323	44,616	8,757	152,866
1972-81 Avg.	49,902	15,769	2,674	1,943	70,288
1982-91 Avg.	100,440	32,877	86,558	15,570	235,444
'92 % of Ttl.	60.45	0.32	38.98	0.24	100.0

^a Data source: Final IBM computer runs.

Appendix Table 14. Commercial sockeye salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959 - 1992^a.

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Resurr. Bay	0	0.1	0	0	0	0	0	0	0	74.5	99.4	1.8
Aialik Bay	1.3	0.2	4.3	2.6	0.5	0	0	0	0	0	0	3.1
Nuka Bay	8.3	6.7	8.2	5.1	0.5	0	2.0	0	2.2	1.5	0	1.0
Port Dick	0	0	0	0	0	0	0	0	0	0	0	0
Halibut Cove	1.3	1.4	0.8	2.0	1.1	0.7	1.4	1.5	1.9	2.7	1.7	1.3
Tutka/Barabara	1.1	1.7	3.0	5.2	2.9	9.0	5.2	6.0	11.8	6.3	5.6	6.0
Seldovia Bay	0.4	1.2	1.2	1.7	1.2	2.1	0.9	1.0	2.2	1.9	1.1	1.2
Port Graham Bay	6.6	7.8	5.2	6.8	7.8	5.5	3.5	2.7	10.4	7.7	4.3	3.7
Kamishak-Douglas	0	0	0	0	0	0	0	0	0	0	0	0
McNeil/Mikfik	0	0.7	0	0	0	1.9	0.2	0	0	0	8.9	2.8
Paint River	0	0	0	0	0	0	0	0	0	0	0	0
Chenik Creek	0	0	0	0	0	0	0	0	0.2	0	1.9	0
Bruin (Kirschner)	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	2.6	4.9	0.1	1.9	1.1	1.5	0.8	4.1	0.3	0.6	0.1	0
Total	21.6	24.7	22.8	25.3	15.1	20.7	14.0	15.3	29.0	95.2	122.8	20.9

Location	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Resurr. Bay	2.2	0.1	0	0	0	0	0	0	0	0	0.6	0
Aialik Bay	0	0.3	3.1	0.2	0.6	0	5.8	0	0	0.1	8.7	3.0
Nuka Bay	1.6	26.1	1.1	0.1	0	18.9	31.1	10.6	24.4	21.5	17.2	66.3
Port Dick	0	0	0	0	0	0	0	0	0	0	0	0
Halibut Cove	1.3	3.7	2.1	3.0	3.4	5.1	3.6	12.9	5.3	11.5	11.2	1.2
Tutka/Barabara	10.0	14.8	8.1	10.8	12.6	14.2	21.3	92.1	15.6	13.2	41.0	15.8
Seldovia Bay	1.5	2.3	2.2	2.3	2.1	2.1	3.0	5.6	2.6	1.6	5.3	5.0
Port Graham Bay	5.6	10.5	11.7	10.9	9.2	13.6	26.6	30.5	12.9	16.5	20.3	21.5
Kamishak-Douglas	0	0	0	0	0	0.2	5.3	4.6	0.5	0	4.9	0
McNeil/Mikfik	0	0	0	0	0	3.8	2.1	0	1.2	3.9	0	17.8
Paint River	0	0	0	0	0	0	0	0	0	0	0	0
Chenik Creek	0	0	0	0	0	0	0	0	0	0	0	0.3
Bruin (Kirschner)	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0	0.1	0.8	0.1	0.2	0.3	2.8	0.1	1.9	1.1	1.1	0.4
Total	22.2	57.9	29.1	27.4	28.1	58.2	101.6	156.4	64.4	69.4	110.3	131.3

Location	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Resurr. Bay	0	3.4	0.3	0	0.2	0	0	0	0	0
Aialik Bay	25.9	50.8	24.1	3.0	3.5	20.2	8.5	7.7	4.7	3.4
Nuka Bay	16.8	29.2	91.8	48.4	31.8	9.5	10.3	5.7	1.8	0
Port Dick	0	0	0	0	0	0	0	11.7	4.6	0.6
Halibut Cove	77.7	116.6	63.2	15.2	69.1	24.9	46.6	20.3	36.0	14.7
China Poot ^b						63.6	35.8	49.9	116.7	76.0
Tutka/Barabara	35.9	26.7	14.9	16.3	14.7	12.9	13.4	7.9	13.4	12.9
Seldovia Bay	6.7	4.9	2.6	3.2	3.5	2.5	1.8	4.3	4.0	3.3
Port Graham Bay	13.4	12.5	3.5	2.0	2.4	1.4	0	0	0	0
Kamishak-Douglas	2.8	0	0.7	7.6	2.3	5.0	0	0.1	7.0	9.9
McNeil/Mikfik	5.8	10.7	67.0	27.5	21.4	14.6	7.0	9.1	12.9	4.0
Paint River	0	0	0	0	0	0	0	0	0.4	0
Chenik Creek	2.7	13.9	10.6	111.3	98.5	164.2	38.9	70.3	60.4	14.4
Bruin/Kirschner	0	0	0	0	0	0	0.2	14.5	55.9	40.5
Miscellaneous	0	0.3	0	0.4	1.6	0.2	0.8	2.4	0.1	0
Total	187.6	269.0	278.7	234.9	248.8	319.0	163.3	203.9	317.9	176.6

^a Data source: Final IBM computer runs.

^b China Poot was part of Halibut Cove Subdistrict prior to 1988, includes China Poot, Peterson, and Neptune Bays.

Appendix Table 15. Harvest of sockeye salmon returns to China Poot Bay in the Southern District of Lower Cook Inlet, by user group, 1979 - 1992.

Return Year	Sport Harvest	Personal Use Harvest	Commercial Harvest	Total Return ^a
1979	650	0	^b	650
1980	1,000	1,000	12,000	14,000
1981	1,500	0	10,000	11,500
1982	450	1,320	200	3,400
1983	480	5,910	84,020	90,420
1984	500	2,000	114,360	117,360
1985	500	3,000	61,500	65,920
1986	100	150	18,350	18,800
1987	200	2,000	21,500	23,700
1988	500	1,500	91,469	93,939
1989	1,000	7,000	79,714	87,714
1990	500	3,000	49,587 ^c	53,087
1991	1,000	4,000	117,000 ^{c,d}	122,000 ^d
1992	300	3,500	89,791 ^{c,d}	93,591 ^d
1979-91 Avg.	645	2,375	50,746	54,038

^a Total return includes estimated escapements (i.e. non-harvested fish).

^b No data.

^c Portions of the commercial sockeye harvest in China Poot Bay, Halibut Cove, and Tutka Bay Subdistricts were attributed to the Leisure Lake sockeye return.

^d Includes returns to both Leisure and Hazel Lakes.

Appendix Table 16. Commercial catch and escapement of sockeye salmon at Chenik Lake in the Kamishak Bay District of Lower Cook Inlet, 1979 - 1992.

Year	Escapement ^a	Harvest	Total Return
1975	100	b	100
1976	900	b	900
1977	200	b	200
1978	100	b	100
1979	c	b	b
1980	3,500	b	3,500
1981	2,500	b	2,500
1982	8,000	b	8,000
1983	11,000	2,800	13,800
1984	13,000	16,500	29,500
1985	3,500	10,500	14,000
1986	7,000	111,000	118,000
1987	10,000	102,000	112,000
1988	9,000	164,200	173,200
1989	12,000 ^d	38,905	50,905
1990	17,000	70,347	87,347
1991	10,189 ^d	60,397	70,586
1992	9,269 ^d	14,378	23,647

^a Estimated from aerial surveys unless otherwise noted.

^b Closed to fishing.

^c No data.

^d Weir counts.

Appendix Table 17. Commercial coho salmon catch in numbers of fish by district, Lower Cook Inlet, 1972 - 1992^a.

Year	Southern	Outer	Kamishak	Eastern	Total
1972	1,283	17	31	903	2,234
1973	1,241	31	28	801	2,101
1974	3,054	21	2,915	524	6,514
1975	3,039	7	3,041	124	6,211
1976	1,905	0	1,111	200	3,216
1977	1,255	78	105	360	1,798
1978	4,318	45	1,584	582	6,529
1979	10,846	135	1,116	296	12,393
1980	11,568	16	2,495	426	14,505
1981	7,976	485	1,845	470	10,776
1982	7,165	92	38,685	950	46,892
1983	3,433	54	7,138	594	11,219
1984	3,193	41	13,027	536	16,797
1985	4,258	3,210	2,024	835	10,327
1986	3,095	5,052	9,935	770	18,852
1987	2,163	2,481	8,079	1,631	14,354
1988	2,987	2	4,471	486	7,946
1989	6,667	72	4	5,346	12,089
1990	1,552	74	26	7,645 ^b	9,297
1991	9,415	12	2,337	7,283 ^b	19,047
1992	1,277	1	1,488	3,136 ^b	5,902
20-Year Avg.	4,521	596	5,000	1,538	11,655
1972-81 Avg.	4,649	84	1,427	469	6,628
1982-91 Avg.	4,393	1,109	8,573	2,608	16,682
'92 % of Ttl.	21.64	0.02	25.21	53.13	100.0

^a Data source: Final IBM computer runs.

^b Includes commercial seine catches, Seward Silver Salmon Derby entries, and fish taken for hatchery cost recovery purposes.

Appendix Table 18. Commercial pink salmon catch in numbers of fish by district, Lower Cook Inlet, 1972 - 1992^a.

Year	Southern	Outer	Kamishak	Eastern	Total
1972	9,126	963	342	18,232	28,663
1973	97,574	195,342	12,568	1,919	307,403
1974	48,875	1,300	48	378	50,601
1975	893,615	159,908	9,432	383	1,063,338
1976	99,817	93	1,112	35,423	136,445
1977	157,025	1,129,250	6,308	1,349	1,293,932
1978	251,761	70,080	982	29,738	352,561
1979	986,909	1,945,536	58,484	0	2,990,929
1980	478,019	154,041	101,864	155,779	889,703
1981	1,453,982	1,714,115	66,097	44,989	3,279,183
1982	296,556	67,523	43,871	143,639	551,589
1983	690,254	199,794	1,405	36,154	927,607
1984	336,595	89,085	138,145	136,797	700,622
1985	518,889	618,222	194	92,403	1,229,708
1986	542,521	401,755	423,774	40,243	1,408,293
1987	90,522	23,890	72,684	14,333	201,429
1988	852,382	6,094	61,080	1,740	921,296
1989	987,488	52,677	256,669	92	1,296,926
1990	178,087	191,320	2,448	11,815	383,670
1991	253,962	359,664	47,833	167,250	828,709
1992	417,021	146	2,594	60,007	479,768
20-Year Avg.	461,198	369,033	65,267	46,633	942,130
1972-81 Avg.	447,670	537,063	25,724	28,819	1,039,276
1982-91 Avg.	474,726	201,002	104,810	64,447	844,985
'92 % of Ttl.	86.92	0.03	0.54	12.51	100.0

^a Data source: Final IBM computer runs.

Appendix Table 19. Commercial pink salmon catch in thousands of fish by subdistrict during odd-numbered years, Lower Cook Inlet, 1959 - 1991^a.

Location	1959	1961	1963	1965	1967	1969	1971	1973	1975	1977	1979	1981
Humpy Creek	13.2	34.5	20.6	6.7	6.9	0.6	0	37.3	242.1	26.4	277.0	239.9
Halibut Cove and Lagoon		33.4	36.9	7.1	33.4	0	11.4	7.2	97.2	16.3	27.1	11.1
Tutka/Barab.	14.4	106.8	37.7	44.6	31.6	32.9	3.9	20.0	89.2	21.9	416.8	1,026.6
Seldovia Bay	4.9	15.1	1.6	19.2	11.7	28.8	27.4	19.4	429.6	47.6	140.8	126.4
Pt. Graham Bay	5.3	1.0	2.7	12.4	5.1	2.0	1.0	13.9	18.3	44.8	124.7	45.9
Dogfish Bay	1.6	0	0	0.1	2.3	0	10.4	0.3	0	5.0	7.4	22.9
Port Chatham	1.2	0	0.8	0	0	0	26.3	20.6	16.0	1.4	174.4	55.8
Windy Bay	3.1	2.2	0	5.4	0	0	57.3	68.5	18.1	173.2	552.7	2.9
Rocky Bay	2.3	0	1.4	0.1	0	0	0.1	0.2	0	11.6	122.2	16.5
Port Dick Bay	28.2	92.9	19.0	15.3	259.9	51.5	94.6	96.6	90.3	881.7	964.8	1,140.9
Nuka Bay	33.3	2.0	0.3	0	0.1	0	119.7	8.1	35.4	56.3	121.7	395.1
Resurrection Bay	8.4	0	0	0	1.2	0	0	0	0	0	0	32.6
Bruin Bay	0	0	12.3	0.9	2.1	0	11.7	0	0	6.2	40.3	51.9
Rocky/Ursus Coves	3.7	2.7	44.2	0	13.0	52.8	16.4	7.9	0	0	14.4	14.1
Iniskin and Cottonwood Bays	1.5	3.3	21.8	0	0.1	26.0	0	4.7	0	0.1	0.2	0
Miscellaneous	3.6	9.5	4.3	3.8	8.1	7.8	12.7	2.7	27.1	1.4	6.4	16.6
Total	124.7	303.4	203.6	115.6	375.5	202.4	392.9	307.4	1,063.3	1,293.9	2,990.9	3,199.2

Location	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001	2003	2005
Humpy Creek	8.1	5.6	0	91.4	0							
Halibut Cove and Lagoon	18.8	5.9	30.5	254.4	91.1							
China Poot ^b				8.5	135.7							
Tutka/Barab.	616.0	491.2	56.5	632.1	117.6							
Seldovia Bay	43.3	3.8	1.2	1.1	0.3							
Pt. Graham Bay	4.1	12.5	2.3	0	0							
Dogfish Bay	0.2	0	0	0	0							
Port Chatham	3.3	7.0	0	9.7	7.5							
Windy Bay	0	4.8	0	0	49.1							
Rocky Bay	1.3	0	0	0	0							
Port Dick Bay	140.0	455.6	3.0	0	289.7							
Nuka Bay	55.0	150.8	20.9	43.0	10.6							
Resurrection Bay	27.1	74.6	11.8	0	0							
Bruin Bay	0.3	0	1.2	202.8	45.1							
Rocky/Ursus Coves	0	0	69.4	53.8	0							
Iniskin and Cottonwood Bays	0.3	0	0.2	0	0							
Miscellaneous	9.8	17.9	4.4	0.1	82.0							
Total	927.6	1,229.7	201.4	1,296.9	828.7							

^a Data source: Final IBM computer runs.

^b China Poot (including Neptune Bay) was part of Halibut Cove Sub-district prior to 1988.

Appendix Table 20. Commercial pink salmon catch in thousands of fish by subdistrict during even-numbered years, Lower Cook Inlet, 1960 - 1992^a.

Location	1960	1962	1964	1966	1968	1970	1972	1974	1976	1978	1980	1982
Humpty Creek	51.0	73.9	53.5	24.6	2.6	85.2	1.7	33.3	3.3	16.3	48.6	4.9
Halibut Cove and Lagoon	20.7	35.5	28.9	16.0	41.3	28.9	0.4	2.2	69.8	27.8	4.7	1.0
Tutka/Barab.	87.6	279.5	100.9	53.5	26.9	43.9	5.2	5.5	18.0	167.9	312.5	184.9
Seldovia Bay	42.6	142.8	37.4	44.1	23.6	29.0	0.2	3.5	3.0	35.8	81.7	70.3
Pt. Graham Bay	7.1	18.1	38.4	5.1	23.0	19.6	1.1	4.5	3.9	4.0	30.5	35.4
Dogfish Bay	1.8	1.4	0.1	7.1	0	9.8	0.3	0	0	0.3	4.7	1.7
Port Chatham	15.7	102.2	67.1	6.7	10.0	1.9	0	0	0	0	1.8	12.6
Windy Bay	29.2	85.5	68.6	20.1	3.4	0.8	0	0	0	0	0	0
Rocky Bay	17.0	225.9	53.2	0	10.8	36.8	0	0	0	0	1.4	0
Pt. Dick Bay	257.4	1,118.3	526.3	296.8	55.0	336.5	0	0.6	0	63.6	133.3	44.0
Nuka Bay	26.6	129.8	23.8	0	90.2	48.4	0.3	0.7	0.1	6.3	12.8	8.7
Resurrection Bay	5.8	0.1	0.3	0	37.4	40.2	18.2	0	35.4	29.7	155.8	137.4
Bruin Bay	2.6	0	0	0	126.2	10.2	0	0	0	0	100.6	13.3
Rocky/Ursus Coves	6.6	3.2	13.5	2.9	18.0	7.5	0	0	0	0.1	0	20.2
Iniskin and Cottonwood Bays	2.1	3.2	4.3	0	9.9	3.5	0	0	0.1	0.1	0.1	0.4
Miscellaneous	37.8	28.9	39.1	102.3	107.1	14.0	1.3	0.3	2.8	0.7	0.2	16.8
Total	611.6	2,248.3	1,055.4	579.2	585.4	716.2	28.7	50.6	136.4	352.6	889.7	551.6

Location	1984	1986	1988	1990	1992	1994	1996	1998	2000	2002	2004	2006
Humpty Creek	53.5	116.7	0	0	0							
Halibut Cove and Lagoon	10.9	14.0	106.8	91.0	58.4							
China Poot ^b			5.4	46.1	35.7							
Tutka/Barab.	262.0	400.2	723.9	37.4	320.9							
Seldovia Bay	2.2	2.8	5.5	3.6	1.9							
Pt. Graham Bay	8.0	8.8	10.7	0	0							
Dogfish Bay	0.1	0	0	0	0							
Port Chatham	0	0	0	22.1	0							
Windy Bay	0	0	0	0	0							
Rocky Bay	0	0	0	0	0							
Pt. Dick Bay	84.6	304.0	5.9	169.1	0.1							
Nuka Bay	4.4	97.8	0.2	0.2	0							
Resurrection Bay	122.3	36.5	0.5	0	0							
Bruin Bay	125.2	349.7	5.0	0.4	1.9							
Rocky/Ursus Coves	8.5	71.1	49.9	0	0.3							
Iniskin and Cottonwood Bays	0.4	0.2	1.3	0	T							
Miscellaneous	18.5	6.5	6.2	13.8	60.6							
Total	700.6	1,408.3	921.3	383.7	479.8							

^a Data source: Final IBM computer runs.

^b China Poot (including Neptune Bay) was part of Halibut Cove Sub-district prior to 1988.

Appendix Table 21. Commercial chum salmon catch in numbers of fish by district, Lower Cook Inlet, 1972 - 1992^a.

Year	Southern	Outer	Kamishak	Eastern	Total
1972	4,936	43,466	26,374	767	75,543
1973	3,588	76,286	35,584	55	115,513
1974	2,725	11,924	4,554	7	19,210
1975	5,428	11,348	4,868	2	21,646
1976	1,517	412	48,848	45	50,822
1977	6,734	70,167	65,659	3,229	145,789
1978	5,525	19,224	48,669	100	73,518
1979	8,221	180,558	29,711	0	218,490
1980	4,605	32,246	35,921	720	73,492
1981	20,920	238,393	73,501	3,279	336,093
1982	18,446	63,075	108,946	7,698	198,185
1983	14,281	27,203	142,901	7,934	192,319
1984	8,065	3,204	70,736	10,535	92,540
1985	5,513	11,844	8,139	5,144	30,640
1986	5,560	11,701	61,670	3,757	82,688
1987	5,030	28,663	108,412	14,913	157,018
1988	7,742	71,202	218,299	24,668	321,911
1989	3,141	43	7,809	312	11,305
1990	2,433	614	3,597	307	6,951
1991	1,962	14,337	7,853	80	24,232
1992	1,885	181	20,051	86	22,203
20-Year Avg.	6,820	45,796	55,603	4,178	112,395
1972-81 Avg.	6,420	68,402	37,369	820	113,012
1982-91 Avg.	7,219	23,189	73,836	7,535	111,779
'92 % of Total	8.48	0.82	90.32	0.39	100.0

^a Data source: Final IBM computer runs.

Appendix Table 22. Commercial chum salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959 - 1992^a.

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Tutka	0.1	2.4	1.8	2.9	2.4	5.6	1.1	3.9	4.0	1.3	0.7	1.6
Port Graham	2.3	1.8	0.5	4.0	3.8	2.1	0.9	5.3	3.0	2.3	1.3	4.8
Dogfish	4.9	0.4	0.1	0	0.2	0	0	7.0	15.3	0.1	0	50.9
Port Chatham	1.0	2.5	0	2.8	4.3	5.2	0	17.8	0	1.0	0	0.1
Rocky-Windy	14.9	6.4	2.2	8.5	0.3	33.8	8.1	1.7	0	0.5	0	39.4
Port Dick	42.4	51.0	36.8	112.0	110.8	227.4	14.2	60.9	36.0	10.9	5.4	41.2
Nuka	1.7	8.4	1.7	0.5	1.5	0	0	0	1.5	6.9	0	5.9
Resurrection	0.1	0.5	0	0	0	0	0	0	0.1	0.7	0	0.6
Douglas River	0.2	0	0	0	0	0	0	0	0	0	0	0
Kamishak River	0	0	0	0	0	0	0	0	0	3.7	0.4	0
McNeil River	0	0.4	0	0	0	2.7	0.9	0	0.4	8.3	4.4	1.9
Bruin	0	0.3	0.5	0	0.1	0	0.4	0	1.0	7.5	0	12.8
Ursus/Rocky	8.5	8.6	1.8	1.1	2.8	1.2	0	4.0	2.9	1.0	3.6	8.9
Cttnwood/Iniskin	12.1	33.4	10.2	41.7	10.9	38.4	0	0	19.0	25.5	44.4	71.9
Miscellaneous	22.6	0	0	5.8	1.4	6.9	2.5	28.5	2.2	5.4	1.0	2.4
Total	110.8	116.1	55.6	179.3	138.5	323.3	28.1	129.1	85.4	75.1	61.2	242.4

Location	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Tutka	0.5	1.3	0.8	1.4	2.0	0.9	0.8	2.6	2.7	1.8	7.9	8.3
Port Graham	2.0	3.2	2.6	1.0	2.2	0.5	5.0	2.4	4.3	2.5	11.2	7.4
Dogfish	114.5	41.1	0.4	0	0	0	9.4	0	8.5	2.1	71.8	15.6
Port Chatham	2.4	0	0.4	0	0.6	0	0.1	0	1.7	1.3	59.6	16.2
Rocky-Windy	1.4	0	0.9	0	0.3	0	17.7	0	76.7	2.1	7.4	0
Port Dick	0.7	0	33.4	8.1	6.8	0	25.6	10.3	79.0	19.0	95.8	30.3
Nuka	0.1	2.3	40.8	3.9	3.6	0.4	17.4	0.4	14.7	7.8	3.8	0.9
Resurrection	0.4	0.7	0	0	0	0	0	0.1	0	0.7	2.4	7.7
Douglas River	0	0	0	0	0.1	7.1	4.0	2.9	0.7	10.0	46.7	37.1
Kamishak River	0	2.4	0	1.8	0	10.5	0	23.9	17.8	2.8	8.6	9.2
McNeil River	0	2.3	0	2.0	0	16.9	38.5	4.9	6.5	6.3	11.6	32.6
Bruin	1.6	1.8	0	0.7	0	0	0	0	4.0	11.0	1.7	1.3
Ursus/Rocky	10.3	0.2	5.7	0	2.0	2.8	7.8	1.9	0.5	0.3	1.5	13.5
Cttnwood/Iniskin	14.5	19.7	29.9	0	2.8	11.5	15.3	14.9	0.2	5.4	3.5	21.6
Miscellaneous	0.2	0.5	0.6	0.3	1.2	0.2	4.2	9.2	1.2	0.4	2.6	3.5
Total	148.6	75.5	115.5	19.2	21.6	50.8	145.8	73.5	218.5	73.5	336.1	198.0

Location	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Tutka	9.9	3.4	3.2	3.9	3.9	4.7	2.5	1.5	0.8	0.6
Port Graham	1.7	3.6	1.3	0.8	0.4	1.2	0	0	0	0
Dogfish	2.8	1.1	0	0	0	0	0	0	0	0
Port Chatham	2.1	0	1.3	0	0	0	0	0.1	0.1	0
Rocky-Windy	3.2	0	0	0	0	0	0	0	0.5	0
Port Dick	18.0	1.9	9.6	10.4	27.1	64.4	0	0.5	13.7	0.2
Nuka	0.8	0.2	0.8	1.3	1.6	6.8	0	T	T	0
Resurrection	6.9	3.0	3.0	3.5	13.9	23.9	0	0	0	0
Douglas River	27.2	9.2	8.0	11.6	23.7	24.8	0	0.1	3.0	12.5
Kamishak River	23.9	16.2	0.1	0.1	24.6	26.7	0	T	0.7	1.5
McNeil River	67.9	12.0	0	13.7	32.9	104.0	0.1	0.1	0.1	2.0
Bruin	2.6	5.9	0	5.4	0.1	2.8	4.4	0.1	2.6	0.8
Ursus/Rocky	0	3.7	0	22.1	17.2	20.7	3.4	0	0	2.7
Cttnwood/Iniskin	21.4	23.0	0	8.8	9.7	39.2	0	0	1.0	0.2
Miscellaneous	3.9	9.3	3.3	1.1	1.9	2.7	0.9	4.7	1.7	1.6
Total	192.3	92.5	30.6	82.7	157.0	321.9	11.3	7.0	24.2	22.2

^a Data source: Final IBM computer runs.

Appendix Table 23. Estimated sockeye salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1972 - 1992^a.

Year	English Bay	Ander. Beach	Delight Lake	Desire Lake	Bear Lake ^b	Aialik Lake	Mikfik Lake	Chenik Lake	Amakde. Creek	Kam. River	Doug. River	Doug. Beach	Total
1972	14.5	-	10.0	8.0	0.7	0.6	13.0	0.7	1.0	-	-	-	48.5
1973	4.4	-	2.5	5.2	0.2	1.5	2.7	0.3	2.2	-	-	-	19.0
1974	-	-	-	-	0.1	2.2	0.9	0.1	0.4	-	-	-	3.7
1975	2.5	-	2.0	6.5	0	8.0	6.0	0.1	0.8	-	-	-	25.9
1976	6.0	-	6.0	11.0	0.6	8.0	10.0	0.9	1.6	-	0.2	0.1	44.4
1977	12.5	-	5.2	10.7	0	5.0	9.8	0.2	2.6	-	2.6	0.4	49.0
1978	13.5	0.6	8.0	10.0	0	3.0	12.0	0.1	2.6	1.0	-	0.1	50.9
1979	4.4	-	8.0	12.0	0	5.0	6.0	0	1.0	0.4	-	0.3	37.1
1980	12.0	0.3	10.0	17.0	1.5	6.6	6.5	3.5	2.6	0.1	0.4	0.5	61.0
1981	10.5	-	7.3	12.0	0.7	1.8	5.3	2.5	1.9	0.8	0.2	0.3	43.3
1982	20.0	0.6	25.0	18.0	0.5	22.4	35.0	8.0	3.2	10.0	4.2	1.6	148.5
1983	12.0	0.5	7.0	12.0	0.7	20.0	7.0	11.0	1.2	5.0	0.5	0.4	77.3
1984	11.1	1.2	10.5	15.0	0.5	22.0	6.0	13.0	1.4	2.5	0	0.1	83.3
1985	5.0	0.1	26.0	18.0	1.1	8.0	20.0	3.5	0.9	0.8	0	0	83.4
1986	2.8	0.9	13.0	10.0	0.8	7.6	7.8	7.0	1.9	5.0	0.2	0.2	57.2
1987	7.0	0.2	10.5	13.4	0.3	9.2	9.0	10.0	1.1	-	0.1	-	60.8
1988	2.5	0.3	1.2	9.0	0.1	13.0	10.1	9.0	0.4	0.5	0	0.1	46.2
1989	4.5	-	7.7	9.0	0.1	6.5	11.5	12.0	1.2	0.5	0.6	0.2	53.8
1990	3.3	-	5.2	9.5	1.1	5.7	8.8	17.0	1.8	0.2	0.6	-	53.2
1991	7.0	-	4.1	8.2	0.7	3.7	9.7	10.2	1.9	0.7	-	0.1	46.3
1992	6.4	-	5.9	11.9	1.9	2.5	7.8	9.3	1.9	4.9	0.2	-	52.7
20-Year Average	8.2	0.5	8.9	11.3	0.4	8.0	9.9	5.5	1.6	1.0	0.7	0.3	56.3
1972-81 Average	8.9	0.5	6.6	10.3	0.4	4.2	7.2	0.8	1.7	-	0.9	0.3	41.6
1982-91 Average	7.5	0.5	11.0	12.2	0.5	11.8	12.5	10.1	1.5	1.0	0.7	0.3	69.7
Es.Goal	10-20	1	10	10	1	2.5-5	5-7	10	1	*	*	*	51-66

^a Estimated escapements are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.

^b Limited by Bear Lake Management Plan since 1971.

Appendix Table 24. Estimated pink salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1960 - 1992^a.

Stream	Year											
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Humpy Creek	10.0	22.6	56.0	34.7	18.5	28.0	30.0	25.0	24.7	5.4	55.2	45.0
China Poot	9.0	2.0	26.0	-	-	-	-	2.5	6.0	0.2	1.5	2.1
Tutka Lagoon	15.0	15.0	30.0	10.0	20.0	20.0	12.0	7.0	7.9	6.5	6.5	16.7
Barabara Creek	2.0	0.1	1.5	0.1	-	-	5.0	-	2.0	0.9	0.4	4.0
Seldovia River	25.0	25.0	50.0	13.0	60.0	30.0	86.0	55.0	53.2	60.0	23.0	31.1
Port Graham River	15.0	5.0	50.0	2.0	16.0	1.5	24.0	2.0	24.4	4.0	16.6	13.2
Dogfish Lagoon	2.0	-	3.0	-	-	-	-	-	-	-	-	0.3
Port Chatham Creeks	4.0	7.0	7.0	-	-	-	10.0	-	-	-	3.0	15.5
Windy Right Creek	8.0	10.0	12.5	4.9	6.2	2.0	7.0	6.0	2.8	3.2	2.1	13.0
Windy Left Creek	8.0	5.0	12.5	4.5	7.7	10.0	7.0	6.0	6.9	23.0	13.0	35.4
Rocky River	130.0	2.0	200.0	12.0	80.0	0.3	44.0	1.0	43.1	1.0	32.0	1.6
Port Dick Creek	35.0	14.0	40.0	16.0	31.5	50.0	35.0	20.0	29.0	12.0	34.5	97.8
Island Creek	23.2	2.0	15.0	3.6	30.0	0.5	7.0	0.5	4.3	0.1	5.5	0.1
South Nuka Creek	20.0	2.0	22.0	0.1	10.0	-	10.0	-	10.0	3.0	11.0	14.0
Desire Lake Creek	-	-	18.0	-	1.3	-	-	-	-	-	-	30.0
James Lagoon	-	-	-	-	-	-	-	-	-	-	-	-
Aialik Lagoon	-	-	25.0	0.3	-	-	2.0	-	-	-	-	-
Bear Creek	1.4	-	3.1	-	6.4	-	-	-	3.1	-	-	-
Salmon Creek	-	-	-	-	-	-	-	-	-	-	-	-
Thumb Cove	-	-	-	-	-	-	-	-	-	-	-	-
Humpy Cove	-	-	-	-	-	-	-	-	-	-	-	-
Tonsina Creek	-	-	-	-	-	-	-	-	2.9	0.1	-	-
Big Kamishak River	-	-	100.0	75.0	75.0	-	13.0	-	-	-	-	-
Little Kamishak River	-	-	100.0	24.0	-	-	28.0	3.5	-	0.5	2.0	-
Amakdedori Creek	60.0	-	80.0	-	10.0	-	8.0	-	-	1.0	13.0	-
Bruin Bay River	18.0	-	300.0	25.0	-	-	20.0	0.5	-	5.0	40.0	22.0
Sunday Creek	1.5	-	5.0	2.0	-	-	20.0	-	-	1.0	2.0	43.0
Brown's Peak Creek	-	-	25.0	10.0	20.0	10.0	11.0	-	-	2.0	-	8.0
Total	387.1	111.7	1181.6	237.2	392.6	152.3	379.0	129.0	220.3	128.9	261.3	392.8

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Appendix Table 24. (page 2 of 3)

Stream	Year											
	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Humpy Creek	13.8	36.9	17.4	64.0	27.2	86.0	46.1	200.0	64.4	115.0	31.9	104.0
China Poot	1.0	6.0	5.2	21.6	2.0	3.9	11.2	20.6	12.3	5.0	3.1	14.1
Tutka Lagoon	1.5	6.5	2.6	17.6	11.5	14.0	15.0	10.6	17.3	21.1	18.5	12.9
Barabara Creek	0.6	-	0.2	22.7	0.2	5.7	1.4	10.0	5.8	16.8	2.1	14.8
Seldovia River	5.8	14.5	13.7	36.2	25.6	35.7	24.6	43.7	65.5	62.7	38.4	27.9
Port Graham River	2.4	7.0	2.8	27.3	6.5	20.6	6.7	32.7	40.2	18.4	28.9	4.6
Dogfish Lagoon	-	1.0	-	2.3	-	8.1	0.6	7.3	0.3	2.6	2.6	1.0
Port Chatham Creeks	1.0	5.0	0.2	7.7	-	14.2	0.3	20.8	7.7	11.2	2.0	3.5
Windy Right Creek	0.1	4.6	0.1	18.7	0.2	11.1	0.3	10.4	3.3	4.7	4.7	4.3
Windy Left Creek	0.4	12.9	0.1	9.7	0.2	47.3	1.1	74.8	10.9	31.3	4.4	11.9
Rocky River	8.2	2.0	1.5	4.4	2.7	36.7	8.2	85.0	6.4	25.0	6.6	16.6
Port Dick Creek	10.0	26.4	1.5	62.8	12.7	109.3	44.9	116.0	56.1	106.0	19.9	64.1
Island Creek	1.7	0.5	0.5	0.1	-	0.6	0.4	0.6	2.2	25.0	15.0	15.3
South Nuka Creek	0.3	16.0	-	28.0	-	12.0	-	15.0	0.3	16.0	0.4	22.2
Desire Lake Creek	0.3	3.0	-	0.4	0.6	0.8	1.0	3.0	16.0	5.0	12.0	8.5
James Lagoon	-	-	-	-	-	-	-	-	4.6	14.0	6.0	5.1
Aialik Lagoon	-	-	0.1	-	0.4	-	-	-	-	-	5.0	3.0
Bear Creek	0.5	-	4.9	-	10.0	-	7.8	-	13.3	0.4	7.9	0.8
Salmon Creek	-	-	-	-	16.9	-	11.0	-	15.5	0.1	21.0	0.5
Thumb Cove	-	-	1.1	-	2.0	-	2.0	-	1.2	1.0	7.9	4.9
Humpy Cove	-	-	0.6	-	1.4	-	0.9	-	5.7	0.4	4.0	2.0
Tonsina Creek	-	-	1.4	-	5.7	-	1.5	-	0.7	0.2	7.5	5.4
Big Kamishak River	-	15.0	1.0	-	8.0	-	12.0	10.0	2.0	-	5.0	-
Little Kamishak River	-	13.0	-	-	6.0	-	0.4	3.5	0.6	-	2.2	-
Amakdedori Creek	0.2	3.0	1.0	5.0	-	-	0.9	6.0	3.8	1.5	6.3	0.2
Bruin Bay River	2.5	2.0	0.6	20.0	13.5	60.0	33.0	200.0	400.0	95.0	75.0	4.0
Sunday Creek	2.0	5.0	0.1	20.0	0.3	9.0	0.2	12.0	5.2	14.2	12.0	4.7
Brown's Peak Creek	1.2	3.2	0.1	10.0	1.2	13.0	0.9	15.0	2.3	17.7	3.5	1.7
Total	53.5	183.5	56.7	378.5	154.8	488.0	232.4	897.0	763.6	610.3	353.8	358.0

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Appendix Table 24. (page 3 of 3)

Stream	Year									1960-91	
	1984	1985	1986	1987	1988	1989	1990 ^b	1991 ^b	1992 ^b	Average	Goal
Humpy Creek	84.2	117.0	49.7	26.6	21.4	93.0	27.0	17.4	14.9	49.9	25-50
China Poot	8.4	1.9	11.5	3.1	3.9	8.5	4.2	2.6	4.1	7.1	5
Tutka Lagoon	10.5	14.0	13.4	4.8	11.2	11.9	38.5	16.8	26.7	13.7	6-10
Barabara Creek	1.0	1.6	1.8	0.3	0.7	4.5	3.9	10.9	2.2	4.3	18-24
Seldovia River	14.2	22.8	28.2	7.6	16.9	26.2	27.8	30.0	14.7	33.7	25-35
Port Graham River	10.9	26.3	17.5	3.8	7.9	19.1	20.1	29.0	5.4	15.8	20-40
Dogfish Lagoon	0.6	0.2	0.4	1.2	0.3	0.2	7.1	9.3	°	2.5	-
Port Chatham Creeks	7.8	8.9	11.5	10.2	21.0	31.7	27.8	23.8	4.3	10.5	10-15
Windy Right Creek	3.4	5.4	2.5	2.0	1.3	6.6	7.1	20.7	3.9	5.9	10
Windy Left Creek	2.5	8.9	2.2	5.6	3.4	25.2	7.5	34.5	8.2	13.6	30-50
Rocky River	9.0	12.1	12.0	4.5	5.4	10.3	18.0	26.1	25.4	26.5	50
Port Dick Creek	44.6	65.3	41.6	4.5	12.0	55.4	41.7	54.2	6.9	42.6	20-100
Island Creek	35.0	27.9	16.6	0.1	7.2	6.7	25.0	24.4	12.6	9.6	12-18
South Nuka Creek	0.6	3.6	7.0	2.8	1.2	7.3	13.3	16.4	6.1	9.8	10
Desire Lake Creek	23.0	62.5	32.0	11.0	2.5	47.0	1.0	1.3	0.4	12.7	10-20
James Lagoon	4.0	9.0	6.6	1.1	1.7	4.9	3.8	4.4	0.4	5.4	5-10
Aialik Lagoon	4.0	9.4	6.0	1.5	0.7	0.8	-	-	°	4.5	5
Bear Creek	7.7	4.1	14.0	3.5	0.2	1.7	4.4	15.4 ^d	2.3	5.5	5
Salmon Creek	10.2	2.1	8.3	1.7	0.1	1.6	-	°	5.3	7.4	10
Thumb Cove	4.2	14.5	4.0	2.7	0.3	4.2	-	3.4	0.4	3.8	4
Humpy Cove	2.5	5.0	0.9	0.3	0.4	1.0	3.8	-	°	2.1	2
Tonsina Creek	6.0	48.2	11.2	3.4	0.1	0.5	1.2	0.3	°	5.7	5
Big Kamishak River	-	-	5.0	-	1.0	-	-	-	°	24.8	20
Little Kamishak River	0.1	1.6	2.0	-	0.5	-	-	0.9	°	11.1	20
Amakdedori Creek	-	1.0	6.0	0.4	1.0	2.0	0.1	0.7	3.2	9.2	5
Bruin Bay River	110.0	3.5	1200.0	24.0	29.0	350.0	19.0	74.9	3.2	112.4	25-50
Sunday Creek	12.0	11.4	109.0	29.7	18.0	103.0	2.8	20.9	2.9	17.3	10
Brown's Peak Creek	6.8	7.0	28.0	40.2	17.0	120.0	1.0	16.7	5.0	14.5	10
Total	423.2	495.2	1,648.9	196.6	186.3	943.3	306.1	455.0	158.4	472.8	377-593

^a Estimated escapements are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.

^b Escapement estimates in the Southern, Outer, and Eastern Districts derived from periodic ground surveys with stream life factors applied. Kamishak estimates are unexpanded live counts.

^c Insufficient survey data for escapement estimates.

^d Combined escapement count for both Bear and Salmon Creeks.

Appendix Table 25. Estimated chum salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1972 - 1992^a.

Year	Port Grhm.	Dogfish Lagoon	Rocky River	Pt.Dk Head	Isl. Creek	Big Kam.	Little Kam.	McNeil River	Bruin Bay	Ursus Cove	Cotton. Creek	Inisk. Bay	Total
1972	1.5	3.0	3.0	6.0	2.0	-	-	-	1.0	1.6	4.0	10.0	32.1
1973	2.0	1.0	2.0	9.0	7.0	4.0	1.0	10.0	8.0	3.0	4.0	12.0	63.0
1974	0.5	0.6	1.0	0.8	5.0	7.1	0.6	1.5	3.0	3.5	2.5	7.0	33.1
1975	3.0	5.0	25.0	4.0	7.4	1.1	1.9	1.5	1.5	5.0	8.0	7.0	70.4
1976	0.4	3.0	12.0	1.5	1.0	24.0	21.0	10.0	4.0	6.0	5.0	13.5	101.4
1977	5.2	6.4	10.5	5.0	11.1	-	-	20.0	18.0	9.3	10.0	4.4	99.9
1978	4.8	9.3	6.3	8.9	16.9	23.0	30.0	45.0	4.0	9.7	12.5	11.4	181.8
1979	2.2	8.2	35.0	4.0	16.8	15.0	15.0	8.0	15.0	5.0	2.5	4.0	130.7
1980	1.1	4.0	23.0	4.2	10.9	10.0	13.0	8.0	15.0	8.0	4.2	9.3	110.7
1981	4.8	11.5	12.5	4.1	17.5	11.0	6.0	30.0	10.0	10.0	9.0	9.0	135.4
1982	2.5	8.5	2.8	1.7	8.7	25.0	18.0	25.0	10.0	9.0	7.0	12.8	131.0
1983	1.9	5.3	4.0	4.5	36.2	25.0	25.0	48.0	5.5	7.7	8.3	12.0	183.4
1984	2.1	8.6	3.5	2.7	25.6	19.0	12.0	21.0	8.0	7.0	6.5	9.8	125.8
1985	0.5	4.9	2.5	1.0	9.1	6.0	4.5	9.5	2.0	3.0	3.0	5.0	51.0
1986	0.6	2.5	2.0	1.7	8.6	24.0	17.0	22.0	2.0	11.0	11.0	5.9	108.3
1987	1.5	2.0	0.2	6.1	13.2	12.0	18.0	26.0	10.0	9.9	17.0	9.1	125.0
1988	3.5	8.6	0.3	9.0	7.8	15.0	13.0	49.0	7.0	9.4	16.0	9.5	148.1
1989	1.3	1.8	1.2	3.3	4.8	30.0	12.0	34.0	8.0	6.3	8.0	5.9	116.6
1990	2.6	1.0	0.8	1.1	2.3	2.5	7.9	8.0	4.0	3.8	4.3	8.4	46.7
1991	1.1	3.1	-	7.4	17.3	8.7	8.4	10.0	6.0	1.3	7.7	8.3	79.3
1992	1.4	0.8	1.7	5.4	6.7	4.5	7.1	19.2	8.5	1.7	6.1	3.4	65.0
20-Year Average	2.2	4.9	7.8	4.3	11.5	14.1	12.5	20.3	7.1	6.5	7.5	8.7	105.5
1972-81 Average	2.6	5.2	13.0	4.8	9.6	11.7	11.1	14.9	8.0	6.1	6.2	8.8	101.7
1982-91 Average	1.8	4.6	1.9	3.9	13.4	16.0	13.6	25.3	6.3	6.8	8.9	8.7	111.0
Es.Goal	4-8	5-10	20	4	10-15	20	20	20-40	5-10	5-10	10	10	133-177

^a Estimated escapements are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.

Appendix Table 26. Personal use/subsistence set gillnet salmon catch in numbers of fish by species, Southern District, Lower Cook Inlet, 1969 - 1992.

Year	Total Permits Issued	Permits Returned		Permits Actually Fished	Permits Not Fished	NUMBERS			OF Pink	FISH		Total
		Number	%			Chinook	Sockeye	Coho		Chum	Other	
1969	47	44	93.6	35	9	0	9	752	38	0	17	816
1970	78	73	93.6	55	18	0	12	1,179	143	13	39	1,386
1971	112	95	84.8	53	42	2	16	1,549	44	7	20	1,638
1972	135	105	77.8	64	41	1	11	975	48	69	19	1,123
1973	143	128	89.5	82	46	0	18	1,304	84	40	9	1,455
1974	148	118	79.7	52	66	0	16	376	43	77	27	539
1975	292	276	94.5	221	55	4	47	1,960	632	61	95	2,799
1976	242	221	91.3	138	83	16	46	1,962	1,513	56	75	3,668
1977	197	179	90.9	137	42	12	46	2,216	639	119	84	3,116
1978	311	264	84.9	151	113	4	35	2,482	595	34	89	3,239
1979	437	401	91.8	238	163	6	37	2,118	2,251	41	130	4,583
1980	533	494	92.7	299	195	43	32	3,491	1,021	25	153 ^a	4,765
1981	384	374	97.4	274	100	25	64	4,314	732	89	100	5,324
1982	395	378	95.7	307	71	39	46	7,303	955	123	8	8,474
1983	360	328	91.1	210	118	4	21	2,525	330	40	2	2,922
1984	390	346	88.7	219	127	4	25	3,666	821	87	25	4,628
1985	316	302	95.6	205	97	5	43	3,372	166	35	3	3,624
1986	338	310	91.7	247	63	7	68	3,831	3,132	56	0	7,094
1987	361	338	93.6	249	89	5	50	3,977	279	61	0	4,372
1988	438	404	92.2	287	117	14	60	4,877	1,422	75	0	6,448
1989	466	452	97.0	332	120	41	156	7,215	882	53	49	8,396
1990	578	543	93.9	420	123	12	200	8,323	1,846	69	0	10,450
1991	472	459	97.2	295	164	8	47	4,931	366	23	0	5,375
1992	365	350 ^b	95.9	239	111	5	63	2,277	643	21	0	3,009
1969-91 Average	312	288	92.3	199	90	11	48	3,248	782	55	41	4,184

^a Steelhead trout (*Oncorhynchus mykiss*).

^b Figures for 1992 include 348 returned permits and 2 additional inseason oral reports.

Appendix Table 27. Summary of personal use/subsistence salmon gillnet fishermen in the Southern District of Lower Cook Inlet (excluding the Port Graham/English Bay subsistence fishery) by area of residence, 1974 - 1992.

Year	Homer/ Fritz Cr.		AREA Anchorage Area		Halibut Cove		RESIDENCE Anchor Pt./ Ninilchik		OF Seldovia		Pt. Graham/ English Bay		PERMITTEE Kenai/ Soldotna		Other		Total Permits Issued
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1974	108	73.0	20	13.5	6	4.1	4	2.7	1	0.7	3	2.0	5	3.4	1	0.7	148
1975	118	75.2	13	8.3	6	3.8	7	4.5	5	3.2	2	1.3	4	2.5	2	1.3	157
1976	182	70.0	24	9.2	9	3.5	25	9.6	5	1.9	4	1.5	6	2.3	5	1.9	260
1977	153	77.3	8	4.0	8	4.0	17	8.6	7	3.6	0	0.0	2	1.0	3	1.6	198
1978	214	68.8	40	12.9	5	1.6	30	9.6	12	3.8	3	1.0	4	1.3	3	1.0	311
1979	276	62.7	67	15.2	2	0.5	61	13.9	3	0.7	0	0.0	11	2.5	20	4.6	440
1980	310	58.2	81	15.2	0	0.0	80	15.0	7	1.3	0	0.0	42	7.9	13	2.4	533
1981	274	71.4	43	11.2	8	2.1	37	9.6	3	0.8	1	0.3	14	3.6	4	1.0	384
1982	295	74.7	19	4.8	9	2.3	44	11.1	0	0.0	0	0.0	7	1.8	21	5.3	395
1983	267	77.9	24	7.0	3	0.9	33	9.6	8	2.3	0	0.0	0	0.0	8	2.3	343
1984	266	72.0	20	5.4	6	1.6	62	16.8	5	1.4	1	0.3	5	1.4	4	1.1	369
1985	251	79.4	15	4.8	6	1.9	33	10.4	6	1.9	0	0.0	2	0.6	3	1.0	316
1986	280	82.8	18	5.3	4	1.2	29	8.6	1	0.3	0	0.0	1	0.3	5	1.5	338
1987	284	78.7	25	6.9	3	0.8	37	10.3	7	1.9	0	0.0	2	0.6	3	0.8	361
1988	338	77.2	36	8.2	5	1.1	43	9.8	6	1.4	0	0.0	10	2.3	0	0.0	438
1989	348	74.7	36	7.7	5	1.1	51	10.9	8	1.7	0	0.0	6	1.3	12	2.6	466
1990	441	76.3	36*	6.2	5	0.9	65	11.2	12	2.1	0	0.0	6	1.0	13	2.3	578
1991	384	81.4	27*	5.7	8	1.7	41	8.7	6	1.3	0	0.0	4	0.8	2	0.4	472
1992	302	82.7	21*	5.8	5	1.4	32	8.8	3	0.8	0	0.0	1	0.3	1	0.3	365
1974-91 Avg.	266	73.5	31	8.6	5	1.4	39	10.8	6	1.7	1	0.3	7	1.9	7	1.9	362

* Includes Eagle River, Chugiak, Mat-Su Valley, and/or Ft. Richardson.

Appendix Table 28. Subsistence salmon catch in numbers of fish by species for the village of Port Graham, Lower Cook Inlet, 1981 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total	House-holds
1981 ^b	116	1,694	625	298	150	2,883	47
1982 ^b	98	798	508	851	193	2,448	38
1983 ^c	57	1,066	440	169	65	1,797	31
1984 ^c	21	2,095	166	215	6	2,503	34
1985 ^c	156	469	190	42	22	879	^d
1986 ^b	118	279	179	234	13	823	36
1987 ^c	21	186	574	264	69	1,114	31
1988 ^f	90	380	447	577	88	1,582	31
1989	48	94	555	524	46	1,267	32
1990	180	472	811	1,107	68	2,638	31
1991	178	61	355	1,454	173	2,221	32
1992 ^g	127	54	109	446	164	900	32
1981-91 Average	105	690	441	521	81	1,833	34

^a Data source: ADF&G, Subsistence Division, data files.

^b Data include both subsistence set gillnet and rod/reel harvest.

^c Data include only subsistence set gillnet harvest.

^d No data.

^e 46% set gillnet harvest, 54% rod/reel.

^f 51% set gillnet harvest, 49% rod/reel.

^g Preliminary data, no harvest calendars for September or October.

Appendix Table 29. Subsistence salmon catch in numbers of fish by species for the village of English Bay, Lower Cook Inlet, 1981 - 1992^a.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total	House-holds
1981 ^b	24	1,075	314	621	19	2,053	29
1982 ^b	13	1,584	1,305	1,850	36	4,788	31
1983 ^c	0	1,784	367	363	10	2,524	28
1984 ^c	18	1,225	385	404	0	2,032	26
1985 ^c	5	696	530	313	2	1,546	^d
1986 ^b	4	378	296	825	2	1,505	21
1987 ^c	2	626	322	476	45	1,471	21
1988 ^f	8	609	385	1,185	35	2,222	26
1989	0	60	651	868	0	1,579	29
1990	46	636	616	1,968	49	3,305	30
1991	4	574	1,508	3,087	46	5,219	35
1992 ^g	72	400	180	289	59	1,000	35
1981-91 Average	11	841	608	1,088	22	2,568	28

^a Data source: ADF&G, Subsistence Division, data files.

^b Data include both subsistence set gillnet and rod/reel harvest.

^c Data include only subsistence set gillnet harvest.

^d No data.

^e 63% set gillnet harvest, 37% rod/reel harvest.

^f 37% set gillnet harvest, 63% rod/reel.

^g Preliminary data, no harvest calendars for September or October.

Appendix Table 30. FRED Division and/or CIAA salmon stocking projects and releases of salmon fry, fingerling and smolt, in millions of fish, Lower Cook Inlet, 1984 - 1992.

Lake, River, or Bay	Species	1984	1985	1986	1987	1988	1989	1990	1991	1992
Leisure Lake	Sockeye	2.110	2.018	2.350	2.022	2.100	2.000	1.750	2.000	2.000
Chenik Lake	Sockeye	-	-	0.839	1.000	2.600	3.500	3.250	2.200	2.750
Paint River Lakes:										
Upper	Sockeye			0.500	-	1.100	1.000	1.000	0.500	0.500
Lower	Sockeye			0.320	-	0.552	0.500	0.500	0.250	0.250
Elusivak	Sockeye					0.521	0.500	0.500	0	0
Kirschner Lake	Sockeye				0.867	0.521	0.250	0.250	0.250	0.250
Bruin Lake	Sockeye							0.500	0.250	0.250
Ursus Lake	Sockeye									0.250
Port Dick Lake	Sockeye				0.705	0.222	0.430	0	0	0
Hazel Lake	Sockeye					0.783	1.000	1.250	1.300	1.000
English Bay Lakes	Sockeye							0.350	0.241	0.290
Bear Lake	Sockeye						2.200	2.400*	1.619*	2.370*
Total Sockeye		2.110	2.018	4.009	4.594	8.399	11.380	11.750	8.610	10.060
Tutka Bay Hatchery:	Pink	14.730	19.560	22.500	19.570	12.000	30.100	23.600	23.600	23.600
	Chum	0.026	0.018	0.449	4.050	3.180	2.103	1.500	0	0
Caribou Lake	Coho		0.139	0.138	0.150	0.150	0.182	0.180	0.180	0.150
Seldovia Lake	Coho		0.083	0.072	0.045	0.045	0.080	0.050	0.050	0
Seldovia Bay	Chinook				0.084	0.084	0.108	0.099	0.091	0.113
Halibut Cove Lagoon:	Chinook		0.098	0.101	0.094	0.094	0.115	0.112	0.092	0.117
	Pink			2.000	3.000	3.000	6.000	6.000	6.000	6.000
Homer Spit:	Chinook:									
	early		0.152	0.104	0.104	0.104	0.104	0.212	0.191	0.226
	late									0.126
	Pink				0.295	0.300	0.332	0.303	0.303	0.300
	Coho					0.060	0.143	0.123	0.100	0.100

* Includes both fingerlings and "zero check" smolts (see text).

Appendix Table 31. Catch of Pacific herring in short tons and effort in number of permits by district in the commercial sac roe seine fishery, Lower Cook Inlet, 1972 - 1992^a.

Year	<u>Southern</u>		<u>Kamishak</u>		<u>Eastern</u>		<u>Outer</u>		<u>Total</u>	
	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits
1972	1	1	0	0	30	1	0	0	31	2
1973	204	16	243	14	831	25	301	12	1,579	37
1974	110	7	2,114	26	47	5	384	26	2,655	45
1975	24	5	4,119	40	-	-	-	-	4,143	41
1976	0	0	4,842	66	-	-	-	-	4,842	66
1977	291	13	2,908	57	-	-	-	-	3,199	58
1978	17	7	402	44	-	-	-	-	419	44
1979	13	3	415	35	-	-	-	-	428	36
1980	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-
1985	-	-	1,132	23	204	7	12	2	1,348	29
1986	-	-	1,959	54	167	4	28	3	2,154	57
1987	-	-	6,132	63	584	4	202	9	6,918	69
1988	-	-	5,548	75	0	0	0	0	5,605	75
1989	170	6	4,801	75	0	0	0	0	4,971	75
1990	-	-	2,264	75	-	-	-	-	2,264	75
1991	-	-	1,992	58	0	0	0	0	1,992	58
1992	-	-	2,282	56	0	0	0	0	2,282	56
Avg.										
72-91	92	8	2,591	48	207	5	103	6	2,837	52
72-81	94	7	1,880	35	303	10	228	13	2,162	42
82-91	-	-	3,404	60	159	2	35	2	3,607	63

^a Data source: Final IBM computer runs.

Appendix Table 32. Estimated herring biomass and commercial purse seine catch of herring in short tons, exploitation rates, average roe recovery, number of permits fished, and exvessel value in millions of dollars, Kamishak Bay District, Lower Cook Inlet, 1978 - 1992.

Year	Spawning Biomass ^a	Commercial Catch	Total Biomass	Percent Exploitation	Average Roe %	No. of Permits	Exvessel Value ^b
1978	800	402	1,202	33.4	-	44	^c
1979	2,900	415	3,315	12.5	-	36	^c
1980	-	0	-	-	-	-	-
1981	5,130	0	5,130	-	-	-	-
1982	4,835	0	4,835	-	-	-	-
1983	4,750	0	4,750	-	-	-	-
1984	2,885 ^d	0	6,500	-	-	-	-
1985	12,188	1,132	13,320	8.5	11.3	23	1.0
1986	24,042	1,959	26,001	7.5	10.4	54	2.2
1987	29,200	6,132	35,332	17.4	11.3	63	8.4
1988	24,000	5,548	29,548	18.8	11.1	75	9.3
1989	30,900	4,801	35,701	13.5	9.5	75	3.5 ^e
1990	17,400	2,264	19,650	11.5	10.8	75	1.8
1991	16,171 ^f	1,992	18,163 ^f	11.0	11.3	58	1.3
1992	21,795	2,282	24,077	9.5	9.7	56	1.4
1978-91 Avg. ^g	13,477	1,896	15,650	12.1	10.8	58	3.9

^a Spawning biomass estimates are minimal estimates based on aerial surveys.

^b Exvessel values exclude any postseason retroactive adjustments.

^c Data not available.

^d Spawning had already begun on first survey. Total spawning biomass estimate was higher than the peak survey estimate of 2,885 tons.

^e Includes retroactive adjustment.

^f Due to poor aerial survey conditions, 1991 biomass was calculated from the preseason estimate of abundance, adjusted to match observed age composition samples in the 1991 catch.

^g Average excludes 1980 when no data was available.

Appendix Table 33. Summary of herring sac roe seine fishery openings and commercial harvests in the Kamishak Bay District of Lower Cook Inlet, 1969 - 1992.

Year	Dates of Openings	Total Hrs. Open	Harvest (short tons)	Catch Rate (st/hr. open)	No. of Permits Fished
1969-73	No Closed Periods				
1974	1/1 - 5/20		2,114		26
1975	1/1 - 6/6	(Closed Iniskin Bay 5/17)	4,119		40
1976	1/1 - 5/21	(Closed Iniskin Bay 5/17; reopened Kamishak 6/2)	4,842		66
1977	1/1 - 5/31	(Closed Kamishak Dist. 5/12; reopened 5/14 - 5/17; reopened 5/29 - 5/31)	2,908		57
1978 ^a	4/16 - 5/31	96	402	4.2	44
1979	5/12 - 5/15	72	415	5.8	36
1980	CLOSED	0	0		
1981	CLOSED	0	0		
1982	CLOSED	0	0		
1983	CLOSED	0	0		
1984	CLOSED	0	0		
1985	4/20 - 6/15	1,350 (56.2 days)	1,132	0.8	23
1986	4/20 - 6/13	1,303 (54.3 days)	1,303	1.5	54
1987	4/21 - 4/23	65	6,132	94.3	63
1988	4/22 - 4/29	42	5,548	132.1	75
1989	4/17 - 4/30	24.5	4,801	196.0	75
1990	4/22 - 4/23	8	2,264	283.0	75
1991	4/26	1	1,922	1,922.0	58
1992	4/24	0.5	2,282	4,564.0	56

^a Management by emergency order began.

Appendix Table 34. Proposed regulatory changes for the Lower Cook Inlet commercial and personal use salmon and herring fisheries and resultant actions taken at the Alaska Board of Fisheries meeting held in Anchorage, November, 1992^a.

PROPOSAL NUMBER	PROPOSED BY	DESCRIPTION	BOARD ACTION	BOARD VOTE
2	Staff	5 AAC 27.465. KAMISHAK BAY DISTRICT HERRING MANAGEMENT PLAN. Establish a management plan for the Kamishak Bay commercial sac roe herring fishery in LCI, with guidelines for setting allocation amounts and exploitation rates in both the Kamishak Bay sac roe fishery and the Shelikof Straits food and bait fishery.	Adopted	7 - 0
358	S. McGrorty	5 AAC 27.4XX. NEW SECTION. Authorize a herring spawn on kelp ("pound") fishery in the Southern District of LCI.	Opposed	0 - 7
16	Staff	5 AAC 21.320. WEEKLY FISHING PERIODS. Repeal the standard 48-hour weekly commercial salmon seining periods in LCI and specify that the weekly seine fishing periods will be established by EO.	Adopted	7 - 0
17	Staff	5 AAC 21.310. FISHING SEASONS. Repeal the regulatory salmon fishing opening date of July 1 in the Eastern District of LCI and specify that seasons will be established by EO.	Adopted	7 - 0
18	Staff	5 AAC 21.330. GEAR. Change the southern boundary of commercial set gillnet fishing in Seldovia Bay to its traditional location.	Adopted	7 - 0
19	Staff	5 AAC 21.350. CLOSED WATERS. Correct the description of closed waters in Tacoma Cove and Sunday Harbor in the Outer District of LCI.	Adopted	7 - 0
20	Staff	5 AAC 21.201. SEAWARD BOUNDARY OF DISTRICTS. Establish a seaward boundary for the purpose of managing the salmon net fishery in the Kamishak Bay District of LCI.	Adopted	7 - 0

-continued-

Appendix Table 34. (page 2 of 2)

PROPOSAL NUMBER	PROPOSED BY	DESCRIPTION	BOARD ACTION	BOARD VOTE
21	P. Brudie	5 AAC 21.200. FISHING DISTRICTS, SUBDISTRICTS, AND SECTIONS. Allow salmon seining to occur up to 3 miles offshore in the Outer and Eastern Districts.	Opposed	0 - 7
22	R. & R. Purpura	5 AAC 21.310. FISHING SEASONS. Allow extra fishing time for set gillnets in Tutka Bay Subdistrict of LCI commensurately with that of purse seining.	Opposed	0 - 7
23	UCIDA	5 AAC 21.330. GEAR. Allow drift gillnets as a legal salmon gear type in Resurrection Bay of the Eastern District of LCI.	Opposed	0 - 7
24	CISA	5 AAC 21.350. CLOSED WATERS. Prohibit the retention of chinook salmon by commercial vessels within Halibut Cove Lagoon.	Opposed	0 - 7
25	S. Peninsula Sportsman's Association	5 AAC 21.310. FISHING SEASONS. Change the regulatory opening date for commercial set gillnetting in the Halibut Cove Subdistrict to the third Monday in June (<i>Amended by a vote of 4 to 3 to change the opening date to June 15, except when June 15 occurs during a closed weekly period, then the season would open on the next regularly scheduled weekly period</i>).	Opposed	3 - 4
360	Port Graham Hatchery, Inc.	5 AAC 21.377. PORT GRAHAM SALMON HATCHERY MANAGEMENT PLAN. Establish a regulatory management plan for the new Port Graham Hatchery in LCI.	Adopted	6 - 1
26	Staff	5 AAC 77.549. PERSONAL USE COHO SALMON FISHERY MANAGEMENT PLAN. Establish a personal use coho salmon set gillnet fishery management plan and regulations in the Southern District of LCI.	Adopted	7 - 0

* Proposals adopted by the Alaska Board of Fisheries in November 1992 become effective in regulation in April 1993 upon approval of language by the Alaska Dept. of Law and subsequent signing by the Lt. Governor.

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